# Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

VOLUME 5.] NEW YORK NOVEMBER 17, 1849. [NUMBER 9.

THE
Scientific American,
THE
BEST MECHANICAL PAPER IN THE WORLD.
CIRCULATION 14,000.
PUBLISHED WEEKLY.
At 128 Fulton Street, New York, (Sun Building,) and 13 Court Street, Boston, Mass.
BY MUNN & COMPANY.
The Principal Office being at New York.
Barlow & Payne, Agents, 89 Chancery Lane, London

TERMS--$2 a year--$1 in advance, and the remainder in 6 months.


## Rail Road News.

### Railroads and Manufactures at the South.

The South has indeed roused herself within a few years, and her capitalists and men of enterprise are directing their energies to the developement of the real resources of that section of the Union. Millions of dollars have already been invested in manufacturing establishments, and other millions will soon take the same direction. Little Delaware, we are assured, has already a greater number of manufacturing establishments, in proportion to her population, than any other State in the Union. Maryland has invested $45,000,000 in railroads, canals and manufactures, and she is still busily and actively employed in various laudable undertakings. Virginia has a like investment of about $60,000,000, and will soon have railroads in active operation to the extent of fifteen hundred miles. North Carolina has five hundred miles of railroads completed or in progress—while even in South Carolina, where, until recently, manufactures where ridiculed or denounced, several extensive factories are now in active progress and successful operation.—Florida, young as she is, has $4,000,000 invested in railroads and manufactories—while Georgia has invested $55,000,000, and has upwards of seventy cotton factories in the full tide of successful experiment. Albama, Mississippi, Missouri, Arkansas, Kentucky and Tennessee, are also animated by the same spirit. Mississippi has fifty-three cotton factories, while Missouri has invested in internal improvements, mines and manufactories, the enormous sum of $85,000,000.

### Extent of Railroads.

We have now in the United States about 8,500 miles of railway completed, at a cost of $230,000,000, and before the close of this year, at least 5,000 miles more will be in contemplation, and capital will then be found rapidly centering towards them. Among these are two stupendous lines—one from Cincinnati to St. Louis, to cost $5,000,000; and another from Lake Michigan or the Mississippi to the Pacific ocean, to cost over $60,000,000, for a distance of more than 2,000 miles. Besides these, Ohio, Pennsylvania, Indiana, Illinois, and, indeed, almost every State has various routes surveyed and in contemplation.

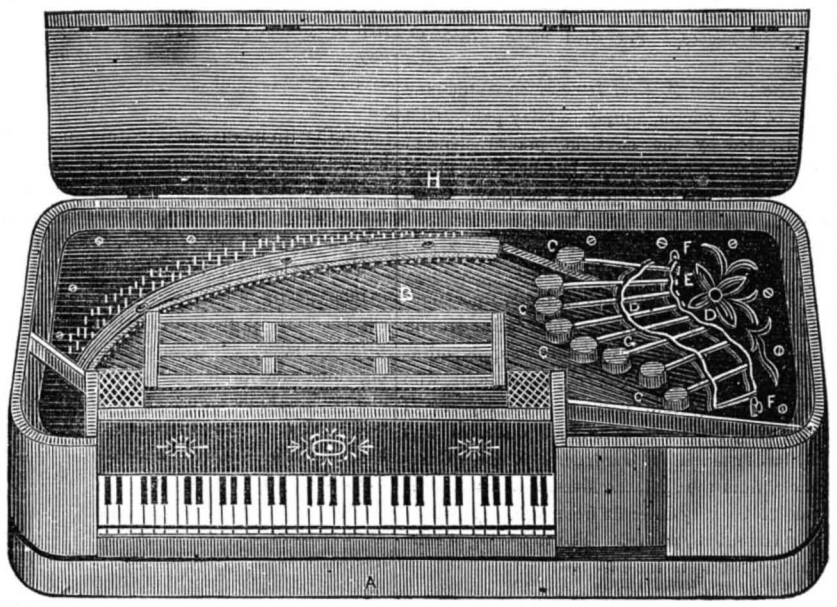
### Railway Law in Illinois.

A general railroad law has been reported by a committee, to the Illinois House of Representatives. It is to incorperate companies for the building of railroads, and designates the terminal of certain routes, including the Vincenness and St. Louis line, and all others with equal claim upon the legislative attention.

### Drummond Light for Railways.

Prof. Grant has made a successful trip on the Bordentown and Amboy Railroad. His light threw its brilliant rays about half a mile on the track, in advance of the engine, and burned steadily for upwards of four hours without requiring adjustment.

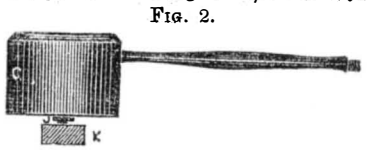
## IMPROVEMENT IN THE PIANO FORTE.---Fig. 1.




This improvement is the invention of Messrs. Boardman & Gray, Pianoforte manufacturers, in the City of Albany, N. Y. It is called the "Dolce Campana Attachment," and has been secured by letters patent. The Piano has always been regarded as of limited powers, prior to those improvements by way of attachments, which are but recent inventions. The soft or harp pedal has been the principal one to vary the tone—but always objectionable by its marring the clearness of the vibrations of the strings, and to overcome which has been the great desideratum with the inventors of the Dolce Campana Attachment, and by which this object is fully attained. It is controlled by a pedal, and produces peculiar qualities and expressions of tone, unlike anything heretofore known; and when combined with the other two pedals, produces the lightest shade of altissimo notes, alternating with the cresendo and diminuendo, and other musical accents of any kind which may be desired, in imitation of an orchestral performance. The particular qualities of this new attachment, are its clearness, brilliancy and delicacy of tone, which falls upon the ear with a surpassing softness, like the chiming peals of distant bells, and hence its peculiar name, "Dolce Campana." (Sweet Bells.) This attachment is perfectly simple, and so constructed that it can be detached from the instrument in a few moments. It will not put the piano out of tune, or in any way affect, except at the will of the performer.

The above is a perspective view of the box of the instrument, with the lid, H, open. A is the box, B are the strings, and C, D, E, F, represent the parts of the Dolce Campana Attachment: this consists of pressing hammers, C C, which pass through openings in the frame, D, and are secured at the back part by nuts, E. There are two standards on which the frame of the pressing hammers are hung on pivots, F F, at each side. This allows the frame, D, to vibrate or rock on its pivot bearings at F F. The frame of the Campana is attached to a stirrup which passes down below, (not seen) to a pedal, which, when pressed by the foot, the weights are drawn down to press upon the sounding frame, to modify its

Fig. 2.




vibrations to produce the effects stated. Fig. 2 is a side view of the depressing hammer, C, resting upon the sounding frame, K. The sounding frame has screws, J, passing through it, which cannot be seen in fig. 1, (one screw for each hammer.) It will therefore be understood that the weights are not resting upon the strings. The hammer is made of a thin box of brass, filled with lead, and the arm is made of brass.

The Piano Fortes of Messrs. Boardman & Gray, with this Attachment, have received the first premium at five several Fairs, viz., State Fairs at Buffalo and Syracuse, New York; Pittsfield, Mass.; Institute at Baltimore, and American Institute, New York City.

### Indian Fishing, and Cooking and Eating Machine.

In "Ross's Adventures in Oregon" the following queer paragraph appears, to teach, we suppose, the value of natural and instinctive art:

"On the 17th, we were paddling along at daylight. On putting on shore to breakfast, four Indians on horseback joined us. The moment they alighted, one set about hobbling their horses, another to gather small sticks, a third to make a fire and a fourth to catch fish. For this purpose the fisherman cut off a bit of his leathern skirt, about the size of a small bean; then pulling out two or three hairs from his horse's tail, for a line, tied the bit of leather to one end of it, in place of a hook or fly. Thus prepared, he entered the river a little way, sat down on a stone, and began throwing the small fish, three or four inches long, on shore, just as fast as he pleased; and while he was thus employed, another picked them up and threw them towards the fire, while the third stuck them up around it in a circle, on small sticks, and they were no sooner up than roasted. The fellows then sitting down, swallowed them—heads, tails, fins and all—in no time, just as one would swallow the yolk of an egg. Now, all this was but the work of a few minutes; and before our man had his kettle ready for the fire, the Indians were already eating their breakfast. When the fish had hold of the bit of wet leather, or bait, their teeth got entangled in it, so as to give time to jerk them on shore, which was to us a new mode of angling; fire produced by the friction of two bits of wood, was also a novelty; but what surprised us most of all, was the regularity with which they proceeded, and the quickness of the whole process, which actually took them less time to perform than it has taken me to note it down."

### Tea Culture in America.

The tea plantation of Mr. Junius Smith, of Greenville, S. C., is said to be in a flourishing condition. Both the black and green tea plants have blossomed, and look well.

## Useful Receipts.

### American Grapes.

The Catawba deservedly stands at the head of the list of all American Grapes, both for table use or for making wine. It is cultivated extensively near Cincinnati and from it excellent Hock wines have been made, equalling the best that come from Europe. It can grow in all parts of New York.

The Isabella is undoubtedly better known and more extensively cultivated than any grape in this country. It is hardy and vigorous—and like the Catawba, exceedingly prolific, both kinds often producing ten bushels to a single vine. From the Isabella an excellent wine is made, equalling when it has a little age, the best Madeira.

The Elsinburg is highly esteemed by many as a table grape. It is without pulp, sweet and delicious flavor, the fruit small but a good bearer.

The Longworth's Ohio, or Segar-box Grape is an excellent desert fruit, but small, very similar in appearance to the Elsinburg; it is without pulp and produces large bunches, sometimes measuring fifteen inches in length. It ripens early and is an excellent bearer.

Norton's Virginia Seedling is in appearance and size of fruit very similar to Longworth's Ohio and Elsinburg. Is very productive, both in the garden or vineyard, and especially valuable at the South, where many kinds rot in wet seasons.

The White Scuppernong is the great wine grape of the South, and is found growing wild from Virginia to Georgia. It is known from all other grapes by its small leaves, which are seldom over two or three inches in diameter. At the South, it is a prodigous bearer, one vine having produced one hundred and fifty gallons of wine in one season. For many years an excellent wine has been made from this grape. This grape is only suited to the climate of our Southern States.

The Alexander, or Muscadel, is an excellent grape and makes first rate red wine. It is very hardy, and is only surpassed by the Catawba.

The Powel Grape produces a fruit that is easily preserved in jars for winter use and on this account it should meet with great favor.—America will soon be able not only to supply her own market with good pure wine, but will also be able to supply other nations.

### To Feed Horses.

Horses should be fed with cut hay among their oats, and some cut oat straw is a good mixture. This makes them chew their oats. Never let horses feed get sour, nor feed musty hay. The beast should be fed like his rider.

### To Cure Swelled Throat in Hogs.

Take of molasses one half a pint, and a table spoouful of hog's lard; to this add of brimstone a piece an inch in length. Melt it over the fire, and when cold or in a liquid state drench the hog with it; and nine times out of ten it will be found to have the desired effect.

### To Prepare Rennet.

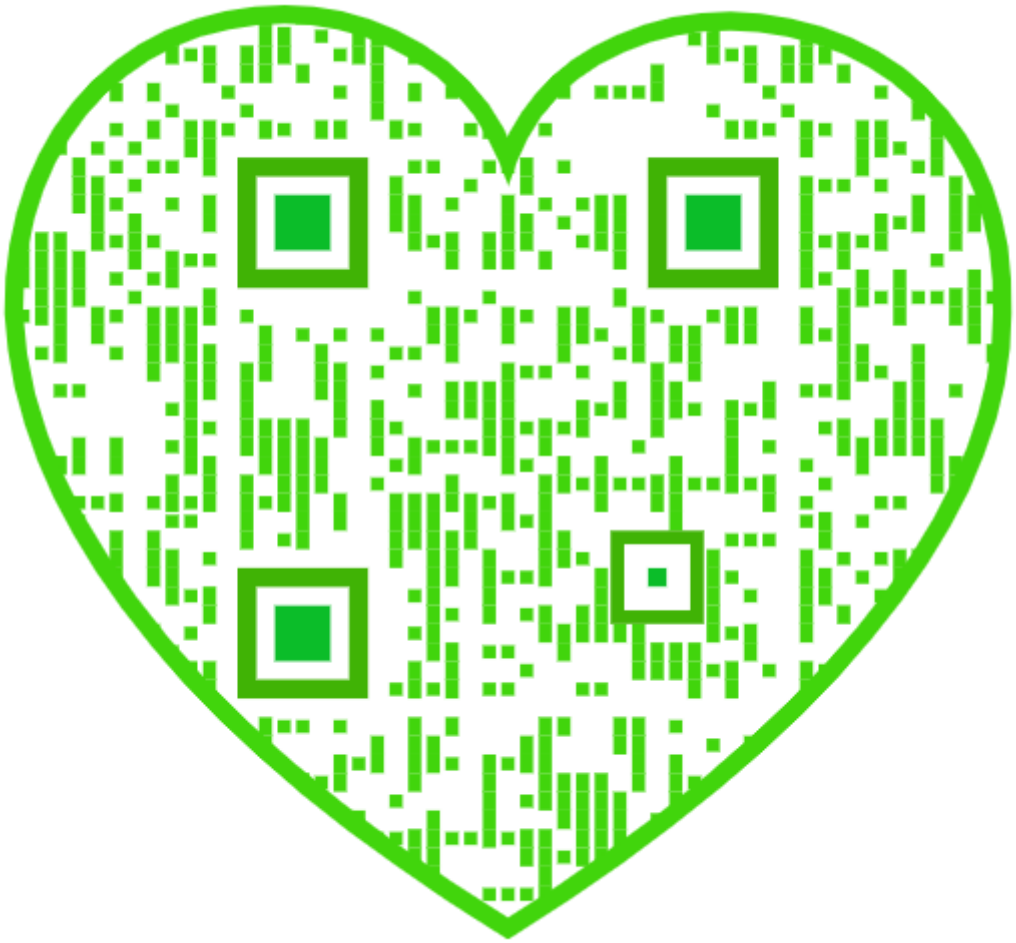
Take a gallon of bloodwarm water to each, rennet; soak, after stiring, for 24 hours; strain the liquor and let it settle, saturate with salt, and skim off the scum.

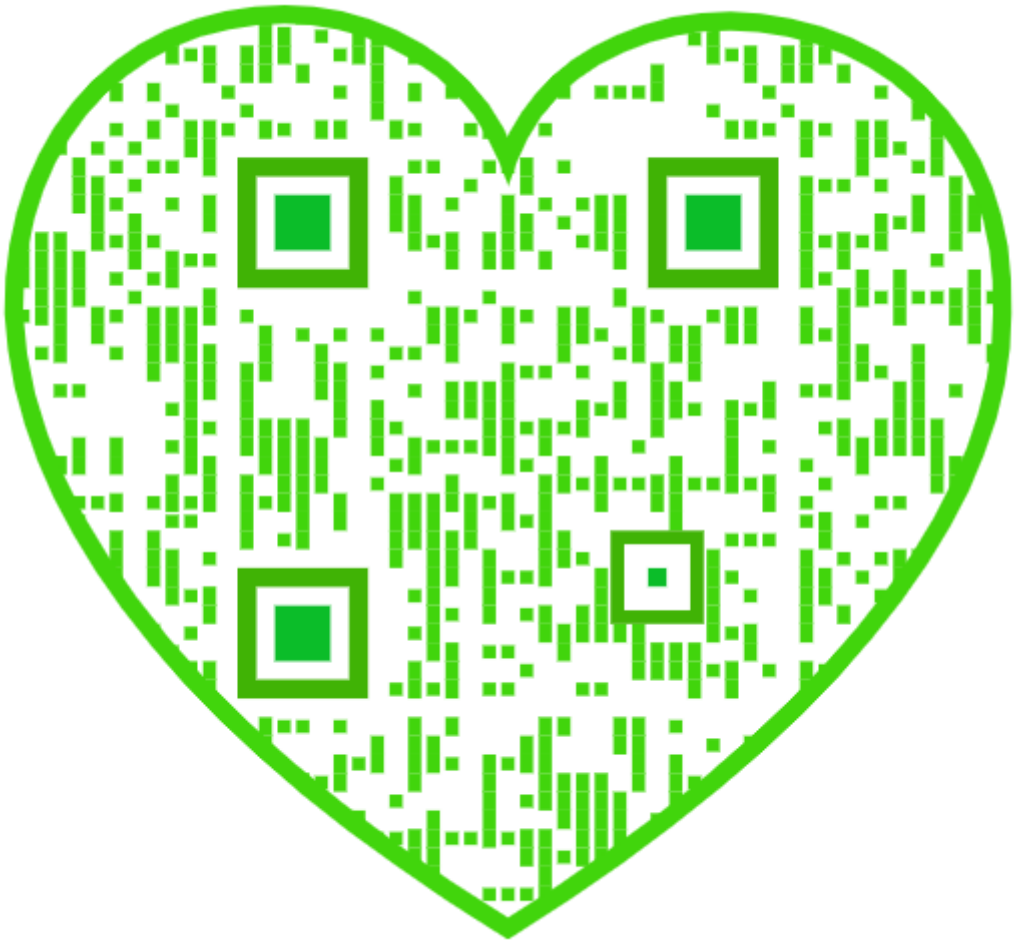
Parsnips are excellent feed for hogs, far better than carrots.

We have two patent cases, which we have left over to next week.

Fighting men need not look for war with Russia at present.

© 1849 SCIENTIFIC AMERICAN, INC





# Miscellaneous.

### American Steel.

This is the most useful metal in the world. We could do without gold or silver, but not without iron or steel. We have lately seen notices of two inventions for the manufacture of steel direct from the pig iron, one in Connecticut and the other in Newark, N. J. For a long time we had to import all our steel from England, and England had to import all her iron from Sweden to make her steel. Within the past year steel has been made at the establishment of the Adirondac Steel Works in Jersey City, and although these works are comparatively in their infancy, having been in operation only since last January, the article produced is preferred, at the same price, for many purposes, to the best English cast steel.

The ore used is produced from Essex county, in this State. at the sources of the Hudson, at an altitnde of 5,000 feet, among the Adirondac Mountains, and about 50 miles West from Lake Champlain. Large expenditures have been made by the proprietors, Archibald McIntyre, of Albany, Archibald Robertson, of Philadelphia, and the late David Henderson, of Jersey City, for the purpose of developing the immense mineral resources of that region.

The ore is here converted into bar iron and transported to the Company's works in Jersey City to be manufactured into steel. Its adaptedness to this purpose was ascertained by Joseph Dixon, Esq..of Jersey City, after a protracted series of experiments made with reference to that object. He also succeeded in the use of anthracite—supposed by experienced English manufactures impossible—and then applied himself to the manufacture of blacklead crucibles possessing sufficiently powerful refractory qualities to withstand the heat of anthracite furnaces. In this too he was successful, and his pots are now in use in England and elsewhere, by the first artisans.

In these, the steel is broken into small pieces, and put into sixteen crucibles of a capacity of forty to sixty pounds, which are placed in as many small furnaces whose tops are even with the surface of the floor. After the lapse of two hours, their molten contents are poured into ingot-moulds, of various sizes. The steel is then readily drawnout upon being re-heated, under heavy hammers, into bars of any desired shape or size.

### A Deep Artesian Well.

The artesian well at Grenelle, in France, attained a depth of 602 yards before a sufficient supply of water could be attained. Some idea of the difficulties encountered by the projectors may be had from the fact that in May, 1837, when the boring had extended to a depth of 418 yards, the hollow tube, with nearly ninety yards of boring rods attached to it, broke and fell to the bottom of the hole, and it was necessary to extract the broken parts before any further progress could be made—a work of fifteen months' duration. Similiar occurrences frequently impeded the labors of the workmen, until at length, in February, 1841, the rods suddenly descended several yards, and in the course of a few hours the water rose to the surface and discharged itself at the rate of 600,000 gallons per hour. At the extreme depth of 602 yards the mercury in the thermometer rose to the height of 81 degrees, and it is supposed that if the boring had been continued to the depth of 1000 yards, the temperature of the water would then have been 104 degrees, and immediately applicable to bathing establishments and other places where warm water is required.

### Effects of Chloroform.

The London Medical Times states that a very melancholy accident recently occurred in Glasgow, Scotland. Dr. Adams, Resident Physician to the Clyde street Hospital, having occasion to use Chloroform, inhaled it himself to try its strength, but without any serious consequences ; repeating, however, this experiment, and incautiously increasing the dose, the effect was fatal; he fell back and immediately expired."

On the 23d August, Mdme. Labrune, a healthy married woman residing at Lagres, in France, died from the effects of Chloroform vapor. She wished to have a tooth extracted, and prior to the operation inhaled the vapor, which was given to her at her own desire. Complete insensibility was not produced at the first trial; more Chloroform was placed on the handkerchief, and she drew a full inspiration. Her countenance immediately became pallid; her features were visibly altered ; there was dilation of the pupils, with a convulsive rolling of the eyes, and no pulse could be felt. Every attempt was made to restore life, but without success. She died as if struck by lightning.

The London Medical Journal adds that the use of Chloroform, simply to allay pain, is not warranted by the cautious practitioners of Great Britain and Europe, but has been abandoned by them as dangerous, and liable to be fatal.

### Fall of Manna.

About four months ago extracts, from foreign papers, gave an account of a fall of Manna near to Mount Ararat in Asia, to supply, miraculously, food to the starving inhabitants, who were suffering from famine. The reports of this alleged miracle were much distorted and by late letters in the Gardener's (English) Chronicle, from the spot, the Manna, at least, turns out to be very different from that by which the Israelites were fed. The following are the facts relating to the case :—

About the 18th or 20th of April last, at a period when there had been, for a whole fortnight, very rainy weather, with strong winds from the S. E., the attention of the shepherds and villagers frequenting the country near Byazid was attracted by the sudden appearance in several localities, of a species of lichen scattered in considerable quantities over certain tracts, measuring from five to ten miles each in circumference. One spot is situated three miles east of Byazid, behind a range of rocky mountains, stretching from the north gradually towards the south east. The other is five miles to the south of Byazid near a similar range of rocks, running in the above named direction. It is remarkable that no one had ever before observed the lichens in the neighborhood, not even the shepherds, who often pasture their flocks on the crags and in almost inaccessible places.

What seems to confirm the assertion that these products were not known previous to their unaccountable appearance is, that last year the crops were greatly injured by locusts, and a famine threatened; had the substance been known to exist anywhere in the vicinity, it would most assuredly have been eagerly sought after and collected last autumn, when the price of wheat had risen to more than double its usual value. A similiar phenomena is said to have occurred at Byazid some years ago, when it is probably that the edible qualities of these lichens became known to the natives; unless showers took place previous to that period. Supposing the lichens to have been blown off some adjoining inaccessible places, and in such great quanties, too, how is the rarity of the occurrence accounted for and how is it that they covered such large tracts of country? No proof has been adduced of any one having seen the fungi fall ; but as the first intelligence was brought by villagers, who early one morning, had observed the lichens strewed over a tract of ground where they had not observed any on the evening before, it is probable that the showers must have taken place during the night. In some localities the one or the other kind of lichen alone was found ; in others, the two species mixed. On the 19th of June, another quantity of lichen was discovered, and as the spot was a well-frequented one, it seems likely that the fall had occurred only a few days previously. From all accounts, the quantities collected have been very great. Dr. Heinig, a physician at Byazid, says that a person could collect at the rate of 1½ lbs. in an hour, which, considering the lightness of the product, is a tolerable quantity. The substance is ground up with wheat and made into bread, or eaten simply in its raw natural state.

### The Past and Present.—Inventions.

At the last anniversary of the Harvard University, Dr. Bethune of this city delivered the oration, (since published) which we consider to be one of the noblest efforts of eloquence on record. The following extract will show something of its powers.

"Far be it from us to speak disrespectfully of the few minds which shone in the twilight of Europe, becoming larger through the fog yet heralding the dawn. No true-hearted student is without a strong antiquarian sense of the interest attached to the beginning of art, letters and civilization ; neither can one who has visited the minsters and cathedrals of Britain by day, or Melrose and Glastonbury by moonlight, ever forget his admiration of the creative genius which combined more than Cyclopean strength with more than Corinthian luxuriance, but we must protest against this sacrificing of convenience for an imitation of the antique, this making venerable of all that is old, this condemnation of the useful as the unspiritual.

To an elevated, healthy imagination, there is more poetry in a nicely constructed steam-engine, working with its Titan sinews and Briarian hands, yet breathing softly as a sleeping child, than in all the knightly tournaments and sacerdotal shows that our ancestors ever wondered at ; all the troubadours of Provence had not a tithe of the romance that a clear, æsthetical eye can see hanging round a village of factory girls, every one of whom is a living story of love, hope, constancy, and courage ; a modern linen weaver's label often presents as fine specimens of Arabesque as can be found in a virtuoso's cabinet; nay, if richness of design, grace of drawing, and harmonious contrasts of color be criteria of good taste, we may point to a Sunday group of servant maids in the fresh pride of their Lowell printed Calicoes, and say, "Solomon in all his glory was not arrayed like one of these !"

### Model Lodging Houses.

The London correspondent of the Chronotype writes as follows of the Model Lodging Houses in that city : "The result of the Poor Man's Clubs has been very gratifying during this time of sickness. I have many friends who are among the founders and active supporters of these establishments, and they all assure me, that the health of inmates, for the sickly months, has been most satisfactory. The deaths among children are very considerably lower than in the surrounding neighborhoods, and the cholera has not caused a single death in the largest of Lodging Houses, containing 300 sets of bedrooms and 1600 persons. I say the largest, because I am precisely informed ; but I believe I should be correct in saying, that no deaths have occurred from this cause in any of these buildings, although raging in the vicinity of several of them.—What hopes for the rich in such a condition of the poor, especially if it becomes general, and rose by successive improvements to fresh immunities and perfections. The Model Lodging Houses are extending in various parts of London, and the trades are associating to carry out their views in this direction. Within the week the journeymen bakers have held a meeting for the purpose. The people who enter these houses are not of the very lowest class, they are chiefly the superior portion of the working classes—families that can appreciate to some degree the benefits of cleanliness and comforts.

### Nankin Cotton.

The Augusta (Ga ) Chronicle says that we were in error in respect to the quantity of Nankin Cotton grown in that State, and says .—

"It is not so prolific as the different varieties of white, and, as the price for the last few years has seldom ruled above ten cents, its culture has been almost entirely abandoned. It has been manufactured into an imitation of of the Indian nankeens almost entirely on acount of Augusta merchants, of whom Thomas G. Casey, now of New York, was the pioneer. More recently it has been extensively manufactured for A. Sibly and T. S. Metcalf, and a large lot is now in progress for Messrs. Adams and Fargo of this city. Of this latter lot we have recently seen some specimens which are equal if not superior to any we have ever seen."

### California News.—Gold, Gold!

By the late news from California, we have the most astounding accounts of gold discoveries that have reached us yet. It is nothing less than a vein of gold in the solid rock—a bona fide mine, the first which has been found in California. Mr. Bayard Taylor writing to the Tribune says :—

"I saw some specimens which were in Col. Fremont's possession. The stone is a redish quartz, filled with rich veins of gold, and far surpasssing the specimens broughtfrom North-Carolina and Georgia. Some stones picked up on the top of the quartz strata, without particular selection, yielded 2 oz. of gold to every 35 lbs. Col. Fremont informed me that the vein had been traced for more than a mile. The thickness on the surface is 2 feet, gradually widening as it descends and showing large particles of gold. The dip downward is only about 20°, so that the mine can be worked with little expense. These are the particulars first given me, when the discovery was announced. Still more astonishing facts have just come to light.

A geologist sent out to examine the place, arrived here last night. He reports having traced the vein a distance of two leagues, with an average breadth of 150 feet. At one extremity of the mine he found large quantities of native silver, which he calculates will fully pay the expense of setting up of machinery and working. The ranche upon which it is situated was purchased by Col. Fremont in 1846 from Alvarado, former Governor of the Territory.

### An Ink Bottle Burst its Biler.

A singular accident, says the Boston Atlas, occurred in the office of the Register of Deeds, on Wednesday forenoon, namely, the explosion of an inkstand. It was one of the old fashioned black "Wedgewood" stands, holding nearly a pint of ink, and was probably about half-filled. The occupant of the desk upon which this stood, being in another part of the building, was astounded by a report from his room, like that of a pistol. On going thither he perceived neither fire or smoke, but a tremendous rivulet of the fluid, which creates so much good and evil, pouring over the desk, and doing immense mischief to some late records, in the interior, which will have to be re-written. Upon examining the stand, a vertical fissure was found, extending from top to bottom, being about four inches.

### Necessity of Coolness in Engineers.

Mr. Seeley, engineer on the New Haven Railroad, lost his life by jumping from the engine to hastily. It appears the train was approaching (on a decending grade) a draw-bridge, and the signal indicated that the draw was up so that the train would run into the river, and he sprang from the locomotive, among the rocks, breaking his scull and nearly every bone in his body. The breakman remained on board, doing what he could to stop the impetus of the train, which passed safely over the bridge. The signal had been wrongly placed.

### Post Office Abuses.

The Philadelphia Spirit of Times, boldly declares that private letters are opened in the Post Office, their contents known, sealed up and delivered to the owner. This is a shameful fraud, if true, and should be inquired into. Sealing a letter with a wafer, and pricking holes in it, will prevent its being opened.

If this is seemingly true there ought to be a searching investigation.

### No American Copyright in England.

By a recent decision in the English Court of Exchequer, it appears that no foreigner can enjoy a copyright for his works in Great Britain, except through a mutual international arrangement between the two countries. This is fair play.

Twelve machinists and engineers belonging to the works of T. F. Secor & Co,, have been discharged because they would not work on the Ohio during all last Sunday, after working all night, without getting any refreshment.—They have published a card in the Tribune.

The number of gas works in England, Wales, Scotland and Ireland is 775, representing a capital of £10,500,000, and yielding an average profit of five per cent.

© 1849 SCIENTIFIC AMERICAN, INC

### Transactions of the British Scientific Association.—No. 3.

REPORT ON THE HEAT OF COMBINTIONS—BY DR. ANDREWS.

Every molecular change in the condition of matter is almost invariably connected with the evolution or the absorption of heat; and the quantity of heat thus set free, or absorbed, bears always a definite relation to the amount of the mechanical or chemical action. To ascertain this relation has been the object of Dr. Andrews in this investigation. The report gives a general view of the actual state of our knowledge on the subject of thermochemistry. We cannot condense within the limits of our journal the numerous points of interest in this Report. They are of the highest scientific interest,—and will be published entire in the Journal of the Association. The following are a few of the principal points:—

1.—The solution of a salt in water is always accompanied by an absorption of heat. 2. If equal weights of the same salt be dissolved in succession in the same liquid, the heat absorbed will be less on each new addition of salt. 3. The heat absorbed by the solution of salt in water holding other salts dissolved is generally less than that absorbed by its solution in water. 4. The heat absorbed by the solution of a salt in the dilute mineral acids is generally greater than that absorbed by its solution in water.—It was further shown by Dr. Andrews that in reference to the combination of acids and bases, the heat developed during the union is determined by the base, and not by the acid. An equivalent of the same base combined with different acids produces nearly the same quantity of heat. When a neutral salt is converted into an acid salt by combining with one or more equivalents of acid, no disengagement of heat occurs. When a double salt is formed by the union of two neutral salts, no disengagement of heat occurs. When a neutral salt is converted into a basic salt, the combination is accompanied by the disengagement of heat. When solutions of two neutral salts are mixed, and a precipitate formed from their mutual decomposition, there is always a disengagement of heat, which although not considerable, is perfectly definite in amount. Numerous results illustrative of this point were given.

The combinations of metals with acids, and their combustion in oxygen, were then examined. The actions of chlorine, iodine, and bromine were also detailed, and the heat developed by the combination of these bodies with metals shown.

Prof. Magnus asked if Dr. Andrews had noticed any difference in the heat of combination of bodies in different allotropic states—as, for instance, the diamond, graphite and carbon. Dr. Andrews stated, that the diamond disengaged 7824 units of heat during its combustion in oxygen gas, in the form of graphite, 7778 units—and in that of wood charcoal, 8080. It has also been thought that differences had been observed in the heat disengaged in various allotropic states.

ON THE PRESENCE OF NITROGEN IN MINERAL WATERS.—BY MR. B. WEST.

This communication was directed to the correction of an error which has prevailed as to the absence of nitrogen in the mineral waters of the Continent, and its constant presence in those of England. After quoting Dr. Granville's "Spas of England," in which this statement is boldly made, the author shows from the analysis of Sigwart and Weiss that nitrogen is found in the waters of Wilbold and Liebenzell. Dr. Heyfeldermentions the Crow Bath near Alpersbach, analyzed by Sigwart, which contains five inches of nitrogen per English gallon. It has also been found at Wilkelmstift, at Tubingen, at the Wildbad near Giengen, and a great many of the spas of Germany. Indeed, it appeared that all the thermal springs, the air of which had been examined, gave evidence of the presence of nitrogen in combination with carbonic acid.

Professor Forchammer stated that nitrogen had been detected in the springs of Iceland, not dissolved in the water, but escaping with the air bubbling up through it.—Dr. Daubeny believed that nitrogen was a constant product of thermal springs. Professor Rogers, of Philadelphia, said that in an extensive examination of the thermale springs of the United States, nitrogen gas was found in every instance; and that also in the sulphurous springs the chalybeat springs, and in the alkaline springs nitrogen is always found, and all the results obtained by American chemists completely confirmed those given by British chemists.—Dr. Miller examined the air which had get into the upper portion of the water barometer of the royal Society and found it pure nitrogen.—Dr. Clanny and other gentlemen spoke to the same point:—all the evidence confirming the statement that nitrogen was a constituent of the air of thermal and other springs.

For the Scientific American.

### Important Discovery that may Lead to Improvements of Great Value.

On a certain day last winter, at the request of one of the most noted political writers of modern times, a brief explanation was sent by letter of an important discovery in science, to one of the most seientific men of the world, in order to obtain his opinion of its correctness or value. After looking at the rough sketch of an explanation that was submitted to him, he began his reply as follows:

"Dear Sir—Your communication of the 12th came to hand on the 16th inst. I do not feel competent to express any definite opinion on your ingenious hypotheses of the curve of least resistance; of the philosophy of its deductions from planetary motions, and its application to ship building. If the rule you have discovered prove the true one, its verification is of vast importance. Then why not bring it to the touchstone of experience at once? A small cost will enable you," &c.

But I have quoted enough to excite more or less the curiosity of every scientific reader, and that is my object in quoting at all. I wish to induce them to examine carefully the reasoning on which that discovery is based.

All mankind, as individuals, as societies, and as nations, are liable to error, and one error will often lead to numberless others.—Even the most learned and scientific men may, age after age, overlook a single important fact, and thereby be led astray in possibly a thousand different ways. The instance of this kind, which we shall now explain, we believe to be of great importance, and one that is the more remarkable, because it is among the "exact sciences," and of every day observation throughout the world. We do not mean that the men alluded to have wholly erred in regard to this question; but simply that they have not understood it fully. Still that small want of thorough understanding has retarded the onward march of improvement more than it would now be possible to estimate; for if our idea be right, the speed on the ocean would have been far greater, and therefore steam would have been used on the ocean long before it was—as it would have then been quite plain that a sufficiency of fuel could be carried for that purpose. It is well known that that important step in human progress was kept back, and all the consequences resulting from it, by a doubt on that point,—a doubt which could not have existed if the speed of vessels had been even one half greater than it then was; and if we are right in all our calculations on this subject, the speed of ocean steamers would have been vastly greater had it not been for that error or oversight of the present world. The error consists, we believe, in not fully or correctly understanding one of the most important principles in matter. It is that principle which the carpenter makes use of to force a nail into wood, and which the farmer takes advantage of to force apart the firm and solid timber. The blacksmith uses it in compelling the particles of red hot iron to arrange themselves in accordance with his wishes. It is that principle or power that demolishes walls when cannon balls are thrown against them. It is that principle or power that carries a ball aloft to the clouds, in spite of the resistance from the air and attraction combined, when it is thrown upwards from a gun.

In all these cases we think science gives it the name of momentum. It is that principle which causes boatmen on the canal to use stout bow lines and snubbing posts: boatmen we think, give the name of headway. It is that principle which causes the water to flow out of the arm of Barker's water wheel more rapidly when the wheel is in revolving motion than when it is at rest. It is that principle which keeps the string firmly extended when we are endeavoring to throw a stone with a sling. It is that principle which is continually exerting such enormous power, as to keep the planets from falling into the sun. In these last three examples science calls it centrifugal force. Philosophers write and speak of centrifugal force as if they considered it a distinct principle in matter, about which they would have known nothing if they had never seen circular motion. Whereas, if they had fully understood the principle we speak of, they would have been able to estimate, with the utmost exactness, all its power, even if circular motion had never been seen or known by them. They could have estimated the exact amount of centrifugal force and its rate of increase even if they had never seen or heard of circular motion. In speaking of this principle under the term "central forces," Nicholson's Encyclopedia explains it by nine propositions.—We will give the first as a specimen:

"1. When two or more bodies revolve at equal distances from the centre of the circle they describe, but with unequal velocities, the central forces necessary to retain them will be to each other as the squares of their velocities. That is, if one revolves twice as fast as the other, it will require four times the retaining force the other does; if with three times the velocity it will require nine times the force to retain it in its orb," &c.

If, instead of all those propositions, of which the foregoing is the first,—if instead of all they have said on motion and on central fortes, they had simply told us that matter resists a change of state, whether of rest or of motion, and that the amount of resistance is in proportion to the amount of change; we might have learned far more from it than from all the lengthy explanation the Encyclopedia gives. That single proposition is capable of solving all that they have given, and far more besides. Let us apply it to the one we have quoted. Suppose a ball placed on a horizontal revolving plain, one hundred inches from its centre, and that the plain revolves from the west, in the direction, north, east, south, &c. When the ball arrives at a point exactly north of the centre, its motion is exactly east, and if let alone it would of course keep going directly east; but being compelled to move in a circle from whatever cause, whether a string or attraction, it will, after passing in its orbit about fourteen inches, have left that straight line one inch,—or in other words it would be moved by the central force one inch from where it would have been, if let alone. But if its velocity were double, it would in the same time have travelled about twenty-eight inches in its orbit, and of course have left that straight line four inches instead of one; or in other words would be compelled to be by the central force four inches from where it would have been if let alone, which is four times as far as when going in the orbit with half that velocity; and to move any resisting substance four times as far, must require four times the force—so says reason, as well as our proposition, so that we arrive at the same conclusion they do, by a rule which, although much shorter than either one of their propositions, will not only solve all of them, but far more besides. For example, if we apply that central force, or its equivalent, to urge the ball onward, on the straight line, instead of drawing it towards a centre, it would in the same time, instead of having left that straight line by one inch, be one inch farther east on the same line it was travelling, than it would have been if let alone. So also, if the same force were drawing it west, it would in the same time have so far retarded its motion, as to leave it one inch farther west than it would have been if let alone; and if the force were four times as great, it would leave it four times as far in the same time from where it would have been. That a body would take these various positions by applying the force in the various ways mentioned, are important truths that are not learned from either one of all the nine propositions alluded to in the Encyclopedia; and yet it is an evident and natural deduction, from the proposition or rule that we have given, and does away with the mystery that has seemed connected with circular motion.

(To be Continued.)

### Experiments in Steam, and Professor Horsford.

MESSRS EDITORS:—It has been of frequent remark that Oxford and Cambridge must of necessity be very wise places, seeing so much wisdom enters and so little leaves them. By the same rule, the following statement will show that Harvard University must be a wise place also.

Half a century ago Gay Lussac and Dr. Dalton experimentally found that a column of air, or any gas, must be heated 480° to double its volume, and very strangely inferred that all vapor and steam followed the same law of rarifaction by heat. This unfortunate mistake has been deferentially adopted in all chemical works and treatises on the steam engine, however generally correct and talented the authors.

The writer of this article having been long and earnestly engaged in discovering the mysterious cause of the explosion of steam boilers, happily discovered that steam heated apart from water, was doubled in volume by four degrees of heat—trebled by sixteen degrees of heat, and farther greatly increased in volume by additional and trivial quantities of heat; and he farther found that steam so heated is transformed into a new and far more economical element of power, which he terms stame; so chemically and mechanically distinct from steam, that the application of fuel for the production of motive force, is thus easily susceptible of immense and unexpected economy, the details of which, having been published in a pamphlet, including diagrams of all necessary and easily constructed instruments for demonstrating the accuracy and intrinsic value of this discovery, which, in extent of usefulness and economy, will be found equal in importance to any discovery of the age.

Count Rumford having left a sum of money to Harvard University—directing the interest thereof to be distributed to any discoverer of any new and useful properties of heat. The writer submitted his pamphlet to the Harvard University, claiming some honorary reward for his great discovery. The University referred the pamphlet and claim to the very learned Rumford Professor and assisting Rumford Committee, who, after a profound contemplation of more than half a year, reported that Gay Lussac was right—the indications of his instrument correct, and the writer's statement that steam was doubled by four degrees of heat, and trebled by sixteen, was ninety times too great, and all this without condescending to try the instrument of the writer.

The Report of Prof. Horsford was published in the Scientific American, page 24, this volume. It merely denies the correctness of the discoveries of the subscriber, but does not detail the experiments, which have been witnessed by the most eminent engineers and learned men in the city of New York, and recently by the Editor of the Scientific American. The subscriber hereby invites the Rumford Professor and Committee to a public comparison of Gay Lussac's instrument, with the simple, unobjectionable and accurate instrument detailed in the writer's pamphlet, at a public exhibition, to be shortly held in New York, for the double purpose of publicly proving the stubborn facts therein stated, and for describing several other important and as wonderful facts, lately discovered—showing that this new element, Stame, will produce motive force so much more economically and abundantly than steam, that the latter element, like the Professor's statement, will be found both pitiful and contemptible.

JAMES FROST.

Brooklyn, N. Y., Nov. 1, 1849.

### Patronage.

The Sciences, after a thousand indignities, retired from the place of Patronage, and having long wandered over the world in grief and distress, were led at last to the cottage of Independence, the daughter of Fortitude, where they were taught by Prudence and Parsimony to support themselves in dignity and quiet.

© 1849 SCIENTIFIC AMERICAN, INC

# New Inventions.

### Improvement in Cracker Baking.

We have lately seen some extracts copied from London papers, relative to what is termed a new mode of making biscuits, (and a good one it is) named Harrison's Hot Air Hexagon Biscuits. The invention is claimed for Mr. Thomas Harrison, of Wapping, England. The flour and water in proper proportions are placed in a cylinder, and the first operation of thoroughly mixing is performed by arms inside. On leaving the cylinder the dough is kneaded by means of a large iron cylinder under which it is passed several times. The required thickness is attained on passing beneath a smaller cylinder. The dough, spread out like a large sheet, then passing along an endless cloth, the machinery moving at each stroke the precise width of a biscuit. As the dough passes along by the rising and falling of a nicely adjusted piece of mechanism, the biscuits are cut into shape and receive the stamp of the patentee. The biscuits are not circular, but have six sides, and therefore, there is not in cutting out, any waste of dough; except a very small portion at each end. Passing along the endless cloth, the biscuits are conducted to the mouth of the oven, where they are received on a machine which draws in the biscuits in a few seconds. Each oven is four and a half feet in width, and twenty-six and a half feet in length. There are four ovens, one above another, and all fed from the same furnace with hot-air. The mixing of the flour and water occupies about 12 minutes, the kneading 5 or 6, and firing half an hour. As each oven contains 650 biscuits, and may be filled within a few minutes of each other, there is no difficulty in producing from flour and water no fewer than 2,600 biscuits in an hour, or nearly a ton of ship biscuits every two hours. The biscuits, are of excellent quality—beautifully crisp and sweet.

Thus the kneading, cutting and baking is one continued operation. The improvement, we think, might be profitably adopted by our large cracker and biscuit bakers. The form of the biscuit does not depend on the machine, but the cutters. The cracker cutting machine of Harrison appears to be the very same as that of Mr. Nivens, of this city, which was exhibited in England three years ago, and an engraving of which will be found on page 57, Vol. 3, Sci. Am. As the latter is an American patented machine, we must be vigilant to watch its honor. With this machine, his Dough Mixing Machine, on page 277, same Vol., and Massey's Drier, page 249, same Vol., which can easily be altered to use the belt only, (that part patented); crackers and biscuits might be manufactured at a great saving. We throw out these hints, believing them to be practically correct.

### Improved Abdominal Supporters.

Mrs. M. W. O'Meara, No. 148 Canal st., this city, has invented a new kind of abdominal supporters, for which measures have been taken to secure a patent, and which is of great value on account of its intrinsic good qualities and simplicity. No pads are used, it accommodates itself to all the motions of the body, without being in the least disordered or displaced, and its worth has been at once recognised by a great demand for it, by persons who have used other kinds.

### Improvement in Saw Mills.

Messrs. A. & W. Beswick, of Tylersville, Ill., have made application for a patent for a very useful improvement in saw mills, to be driven by water power. It gives a beautiful reciprocating motion to the saw, without the employment of a weight, which generally weighs about 500 pounds, in common mills.

### New Buckwheat Cleaner.

Messrs. C. D. & T. L. Vose, of Mehoopany, Wyoming Co., Pa., have invented a new machine for cleaning buckwheat, which is represented to be a good invention, and for which they have taken measures to secure a patent. Its qualities are, the great quantity it can cleanse in a certain space of time, and the complete separation of all dross, &c., from the clean grain.

### Improved Corn Planter.

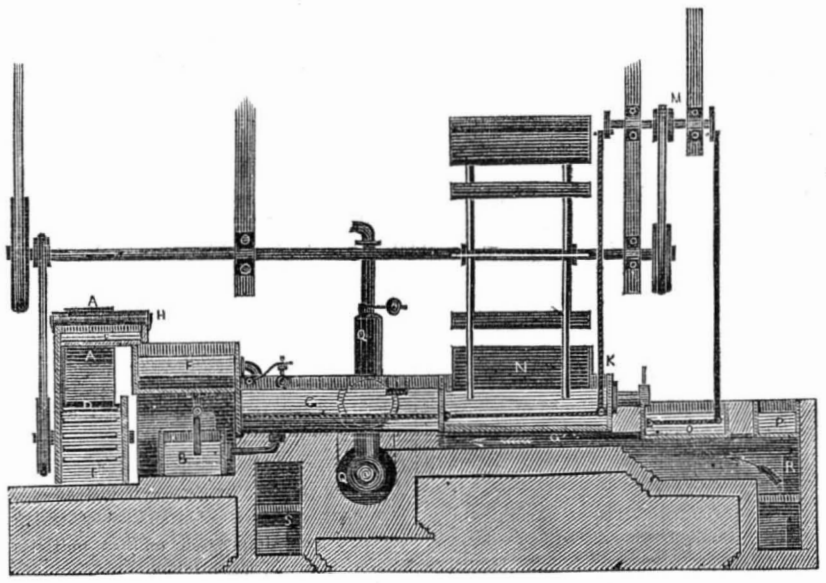
Mr. John P. Groshon, of Yonkers, near New York, has invented an improved Corn Planter, for which he has made application for a patent. It is a most admirable machine, to be drawn by one horse, as it is held and is like a plow, with the corn or seed box just above and a little behind the shoe, which makes the furrow, behind which again, between the stilts or handles, there is a wheel which revolves on the ground, and by a cam on its sides, opens and closes the perforated bottom of the said box, at regular intervals, to deposit the corn, or seed. There is a coverer on each side, which can be set at any height behind the seed box, to cover the corn or seed with a greater or less quantity of soil. This is a good idea.

### Great Printing Press.

Messrs. Hoe & Co., the great Printing Press Manufacturers, are making an eight cylinder press for the "New York Sun," which, at a low speed, will throw off 20,000 copies per hour. It is to be made self-flying, requiring but eight persons to attend it, which is the same number required to attend those which they have at present, and which are the largest kind in use in this or any other country. The cost of the new press will be about $20,000.

Mr. Hoe will no doubt attend the great Industrial Exhibition in London, in 1851, and come off victorious in competition with any other. This press will be the *flying heavy artillery* of the literary world.

## IMPROVEMENT IN THE MANUFACTURE OF SUGAR.




This is an invention of Mr. William H. Clement, of Philadelphia, who has patented the same at home and abread. This engraving is a vertical longitudinal section, and represents the improvements, after crushing the cane, until it is ready to be clarified, and afterwards there is a brief account of the clarification.

Tho juice having been expressed from the cane, is delivered from a suitable trough or spout on to the filter, A. The apparatus consists of an endless band or belt of wire gauze which passes over two rollers, one only of which is shown at B, the other upon the other end of the small receiver, C, and it also passes under the lower drum, D, placed within the cistern or tank, E, the upper part of the gauze is thus in an horizontal position over the receiver, C, and the cane juice being delivered thereon, it filters through and falls into the receiver. As a slow motion is communicated to the guaze filter, the refuse, which will not pass through it into the receiver, is carried with the filter down into the cistern, E, which is filled with water. There are two revolving brushes placed in this cistern, the one placed beneath the surface of the water; this clears the refuse off the filter as it passes downwards; the other roller brush is placed on the side, above the surface of the water; this brush clears the water from the filter, as it emerges from the cistern. When a considerable quantity of refuse has accumulated in the cistern, it is transferred to the still house, and the cistern re-supplied with fresh water from the receiver, C; the liquor is passed into the receiver, F, which has a double bottom, into the space between which steam is admitted. The froth and scum resulting from the boiling in this receiver is skimmed off, and the liquor is passed on to the long shallow receivers, G G; the first of these receivers, G, is provided with a double bottom, between which steam is admitted.—The water resulting from the condensation of the steam in this as well as the bottom of the receiver, F, is received through pipes into the cistern, H. The second reciver, G, is subjected to the heat from the naked fire. At about the middle of the length of the receiver, G, is placed transversely the trough, I, for the purpose of receiving the scum from the surface of the liquor; it being thrown into the trough by reason of the circulation produced in the liquor by the application of heat. The liquor in the receiver, G, would be liable to be burnt by the heat, were it not kept in constant agitation by means of the agitator, K, which is a flat plate perforated with holes, and hinged at one end to the end of the receiver, and attached at the other end by a rod to a crank fixed upon the shaft, M; thus keeping the liquor in the receiver in constant agitation. As the scum rises to the surface of the liquor it is removed by the floats of the wheel, N, which dipping into the liquor, throws the scum upon an inclined board; it then falls into a cistern, whence it is pumped and returned to the first receiver, G. From the receiver, G, the liquor is passed into the clarifier, O, where it is subjected to increased heat from the furnace; in this there is an agitator, similar to the one in the receiver, G; from this the liquor is passed into the tilting vessel, P, where it is again subjected to increased heat, and when sufficiently clarified the vessel is tilted, and the contents poured into a trough, and received directly into the crystallizers, (which are square vessels with inclined bottoms) for the extraction of the molasses; Q, the steam boiler, which is heated by heated air and products from the furnace, R; the furnace, S, is for the purpose of heating the boiler at the commencement of the working, but is afterwards closed when the furnace, R, is at work.

Mr. Clement uses the high pressure process for clarifying the sugar, and he therefore places the saccharine solution, after it has gone through the process described, in a close vessel, under a heavy pressure on the safety-valve. To separate the metallic oxides employed in clarification, he places within the saccharine solution containing the oxide, a porous vessel, containing a weak salt solution, and in this a plate is immersed, and another plate of metal is placed in the sugar solution itself. These two plates are connected to the poles of a battery, and a wire completes the circuit, when the oxide of metal contained in the sugar is deposited on the metal plate. For filtering he employs the phosphate of lime, but with this he also employs the galvanic battery to deposite the metalic oxide, used in the clarification, and which, if it could be entirely dispensed with, would in our opinion be a blessing of no small value. If the reported French discoveries do this, the importance of them cannot be too highly estimated, for sugar is one of the most necessary domestic "*we-can't-do-without*" articles known.

### Improvement in the Manufacture of Candles.

A patent has just been taken out in England, by a gentleman, for moulding candles with a small core in the mould, so as to form a tube in the candle to allow air to come up and supply oxyden to the flame in the centre of the wick, upon the same principle as the argand burners are made. This is a good idea, only it does not provide against the grease running down and filling up the interior of the candles. This would destroy all the intended benefits of the tubes. There was a time when candles were made of good tallow, and could well have been moulded to a good purpose by the above plan, but recent improvements in candles, those at least that are most common in New York, consist in improving the grease upon the squash system—soft as butter in dog-days.

### Improvement in Water Wheels, and the Plumbing of Grist Mill Shafts.

Mr. Marcius B. Ashley, of Watertown, Jefferson Co., N. Y., has made some excellent improvements on Water Wheels, for grist mills, for which he has applied for a patent. The plan is to use a wheel with a vertical shaft, and to gear the runner stone direct on the shaft, and to have a tramming box placed in the bed stone to tram the shaft with great facility, by the miller, when he dresses the stone. He also employs a boot on the lower part of the shaft, so that the shaft itself never wears untrue on the bottom. He also employs peculiar moveable gates to admit the water to the wheel, whereby he nicely regulates the uniform speed and power of the wheel.

### The Britannia Tubular Bridge.

By the late news from England, we learn that one tube of this, the most wonderful work of the age, has been raised to its resting place. This is only one-eighth of the entire bridge, each tube having to be lifted 100 feet above high-water mark. The tube was raised by two Bramah presses, which thus, by two half-inch columns of water, raised a weight of 1,321½ tons 100 feet high. Such are the splendid results of engineering skill. This bridge is made of two parallel lines of tubes for two tracks of the railway. The bridge will be nearly a mile in length. We will endeavor to give a more full and complete description of this undertaking at some other time.

### Invention to Detach Horses from Carriages.

Mr. J. M. Ewing, of Piqua, O, has made an improvement to detach horses when they become unmanageable, from carriages, which appears to be worthy of attention. It consists of a means of instantly locking the fore axle-tree, so that there is no danger of the wheels turning under the bed and upsetting the carriage, and at the same time locking both hind wheels. With this invention applied to a carriage, horses may be detached while going down a steep hill, and the vehicle brought to a firm stand without a passenger rising from his seat.

### The Steamboats and Wheeling Bridge.

Some of the largest steamers on the Ohio river are arranging their chimneys so that they can be lowered in the time of the highest water to go under the great Wheeling bridge. The chimneys of the steamer Telegraph, No. 2, are the largest on the river, being about eighty feet in height, and weighing eight tons. Her captain, Mason, has an invention of his own for lowering them in ten minutes, by means of derricks.

### Improved Matching Machine.

Mr. Robt. Kittle, of Dansville, Livingston Co., N. Y,, has invented a new and useful improvement in machines for matching boards. One of his machines can tongue and groove 3000 feet of stuff in one hour, and do its work well.

At the present pitch of water, in the Conneticut river, the sheet passing over the dam, at the New City of Hadley, measures 18 inches in depth, at the point of this fall. This sheet, one thousand feet long, clearing the lip of the dam at a graceful leap, presents a very beautiful appearance.

© 1849 SCIENTIFIC AMERICAN, INC

Scientific American

NEW YORK, NOVEMBER 17, 1849.

### Sounding the Ocean.

A correspondent of the "Literary American," Mr. Joel Ray, alluding to our remarks on the depth or the Ocean, published a short time ago, agrees generally with what we say in reference to the incompressable nature of water, but doubts our other conclusion, viz., "that the sea lead will descend to the bottom, wherever it may be—at whatever depth." He says—"we believe that after a certain limit, the forces of the under currents which run with great force and activity, might be sufficient to counterbalance the difference of the gravity in the lead *to* that of the water, and in that case the lead, instead of sinking, would either be carried on in the same stratum of the current, or else remain stationary, the line being borne out. In either case the sounder would of course be deceived."

The editor of the Literary American requests our opinion upon the above objections to our conclusions. We can easily give them.

In the first place, the sounder could not be deceived as to finding bottom; and in the second place, the power of the under-currents upon the direct descent of the sounding lead, has been greatly overrated by these who have not had much practical experience, or have not carefully investigated the subject. If the lead does not touch the bottom it will not bring up any evidence of its submarine visit on it,—hence we have always a test of the descent of the lead, by the attachment of shells, gravel, &c., on the grease that is placed in the concave bottom of the lead. The line may be deflected from a direct perpendicular descent, so as to slightly deceive, so far as relates *exactly* to the depth, but that is all, and then it is scarcely possible to be led astray, for according to the length of line run out, it is easy to calculate the deflection from the perpendicular, by the diagonal of the line. This answers all the objections of Mr. Ray, but to make our point still stronger, just let Mr. Ray imagine a block of wood prevented from reaching the earth on account of atmospherical under-currents, if dropped from Porter's balloon on its California voyage, seven miles above terra firma.

### Artificial Fuel.

Coal, in its natural state, consists principally of bitumen, carbon, and some earthy matters. All fuel must contain substances possessing bituminous and carbonaceous properties. Various compounds have been brought forward from time to time, some of them patented, to produce artificial fuel. All those compounds have been combinations of substances of a carbonaceous and bituminous nature, capable of generating inflammable gas and sustaining combustion. Among the first compounds with which we are acquainted, was refuse coal dust, with pitch. This was found capable of producing an intense heat. A patent was taken out in London, in 1800, by a Mr. P. Davy, for an artificial fuel, to burn without smoke or sulphurous smell. It was composed of sea coal dust mixed with charcoal, tanners' bark, and saw dust. The materials were mixed together wet, placed in a kiln and slightly cooked, care being taken not to use too high a temperature. Another artificial fuel was to place upon a shelf, above the fire, a quantity of chalk, or lime, which becoming heated from the combustion of the coal below, concentrated the heat for a long time. Another plan was to bake bituminous and anthracite coal together, to produce a very lasting coke. The proportions were one-third of the bituminous.—Another plan was that of a Mr. T. Sunderland, who took out a patent for a compound of gas, tar, clay, sawdust tanners' bark, and refuse dyewood; all were mixed together, formed into cakes, and dried by any artificial heat. Another compound, and patented too, was sawdust, spent bark, coke, cinder ashes and clay, reduced to powder, mixed, cut and dried into cakes, and then dipped into coal tar, or grease, and afterwards dried. Another compound was peat, clay, nitre, alum, linseed and resin, all ground in a mill and pressed into moulds, like bricks, and afterwards dried in the sun. Another, and an ingenious plan, to harden peat, or swamp earth, was to mix it with powdered, coal, or powdered brimstone, to break up the fibres and deprive the peat or swamp earth of its water, afterwards pressing it and making it into hard blocks. Another compound, by a Mr. Stirling, patented in England, was to mix pulverized coal with tar and clay. All were intimately mixed together, moulded into blocks and dried, and then they were excellent in shape for stowage. The great object of the producers of artificial fuel, has been to make it in such a shape that it would be easily stowed away for sea voyages, but the expense always exceeded the benefits. We might enumerate a great number of compounds of the above nature, varying but little from one another, but which constitute the subjects of no less than twenty-one patents, recorded in the London Repertory of Arts, and in the List of American Patents. We have heard very favorable accounts of using the gas tar along with spent tan bark, in the gas works, to heat the retorts, and for such a purpose the hint may be of benefit to some of our readers. A patent was taken out in Washington, last year for the compressing of coal dust into fuel, but about the most useful artificial fuel that we have heard of lately, is a kind that is made at Newton's Corners, near Albany, N. Y., by grinding swamp muck in a pug mill, then submitting it to a very severe pressure, and afterwards drying it. It is represented to burn well. In looking over the whole of the compounds that are now before us, for the purpose of making artificial fuel, we are impressed with a sense of their great inferiority to coal.

We know of no kind of fuel, taking it for all in all, that can equal the anthracite. It is compact and cleanly, good qualities certainly, but it has another, viz, great and enduring caloric qualities. Bituminous coal is good fuel, but very uncleanly for domestic use especially. One thing can make its use more agreeable, namely, to burn the smoke. This can be done by injecting fine jets of air on the top of the coals. We have recommended this before in the Scientific American, on page 332, Vol. 3, and also since that time. A patent claim, however, appears for the same principle, in our last week's number. The principle is good, and is a German invention. It is one that we again wish to direct the attention of our stove manufacturers, and all those esespecially, who burn wood and bituminous coal in furnaces. Mr. Frost, of Brooklyn, has applied it to a furnace.

### Mechanics' Institutes in England.

The report, just out, of the Lancashire and Cheshire Associated Mechanics' Institutions, in England, is not very encouraging to the friends of education for the people. Few of these institutions in the counties reported upon can be said to flourish. Most of them maintain a death struggle, of which the end cannot be doubtful—some are expiring—many are in debt, and the chief of them have expended during the year more money than they received. Nor is the moral condition better than the material. The best books which their libraries contain are not read; novels and works of amusement alone leave the shelves. A fact quoted by Mr. Hogg, the secretary, as indicative of the value of these libraries—the great number of books issued—is suggestive to us of other conclusions. The frequency of the changes denote a habit of light and superficial reading rather than one of intellectual activity. Another fact indicating decline, is the character of the lectures sought after. At first, these institutions contemplated having session lectures, thirty or forty in number, on the same subject, extending over half-a-year—as at universities. Few of the institutions now engage a lecturer for a course of more than two lectures of a series gradually unfolding a great subject, no three lectures are now given on consecutive sciences or arts. Variety, not connection of topics, is the point aimed at:—amusement, not instruction. The reasons assigned for this decline of interest in sound and useful knowledge are painful to accept. Mr. Hogg seems to think the laboring classes dead to the importance of education—the higher orders to a great extent hostile or indifferent. He is low indeed who has no wish to rise—profoundly ignorant who has no desire for knowledge. The subject is one that needs all the zeal and patience of the good.

The above facts are significant in the highest degree, of a moral deterioration in the working classes of England. When sham, straw, and fustian, are preferred to truth, healthy food and decent clothing for the mind, then may we exclaim, "they are base as self-sold slaves." We wish to *point a moral*, to our own mechanics, from the above. We do not like the name *Mechanics' Institutes*, Merchants' Institutes, or Farmers' Institutes, in this country, as embracing within their folds, peculiar classes only. Some general name, proper to the nature of the Institution, such as Scientific and Literary Association, would be better. But the main point is to give our mechanics advice in supporting such institutions. By all means, we say support them in this Republic, if you desire to stand on the summit of scientific and mechanical excellence. Those cities in England, celebrated for their works of mechanism and mechanical genius, are principally indebted to Mechanics' Institutes. Manchester and Glasgow stand highest, and the reason of this can only be attributed to the early establishment of such institutions there.

We could say a great deal more on this subject, but perhaps we have said enough. We do not find any fault with rational and sensible amusements, we only require them to be rational.

### News about Ærial Navigation.

Mr. Davidson, who recently flourished in the newspapers in connection with a correspondence with the lady of Sir John Franklin, has addressed a letter to a Mobile paper, vindicatory of himself, or rather maledictory towards the innumerable editors who have ridiculed without mercy his proposal to discover the lost navigator by means of his balloon locomotive. He consoles himself as follows:—"Science has its revenges, and sooner or later they will come upon those who ridicule the idea of practical ærial locomotion." The steamboat, the locomotive, and the magnetic telegraph, he says, have undergone and triumphed over the doubts and sneers of men lacking the genius to comprehend them, and the generosity to give them a trial.

Galileo and Columbus were the butts of this spirit of ridicule, carried to persecution, but oblivion has swallowed the shallow crowd who in all ages would have dragged down the spirit of discovery and scientific experiment, while the names of the ridiculed and persecuted men are covered with a kalo of glory. The discoveries in science of modern times—within our own generation—have been such as to claim the utmost latitude for new discoveries, however novel or extraordinary. Nothing conceivable in science or invention is too great for the human mind to anticipate and accomplish.

[There is one idea here that is worthy of attention. It is the same as we have expressed ourselves more than once, and in which we agree with Mr. Davidson; it is this, "whatever the mind of man can conceive, so far as it relates to this globe, can be accomplished;" and so far as respects ærial navigation, we are not skeptics to its accomplishment, but if it be accomplished at all, it must be by some new discovery, hitherto unthought of, and very different from any now proposed, none of which at the present moment are new, or for which the projectors deserve any credit.

On Saturday the 3rd inst., Capt. J. Taggart was to make an ascent in his ærial locomotive, at Boston, but the project has been a failure complete.

### A Case of Long Fasting.

Mr. J. M. Carver, of Brownsville, Pa., informs us that his sister has fasted longer without food than Abby Hutchinson, having tasted no food for twenty-four days. She was afflicted with inflammation, and all that was administered to her, during that period, was ice and ice water. Such cases exhibit an almost miraculous kind dealing of a good Providence.

Some correspondents have sent us too long articles, and others are not careful in their penmanship. We cannot publish their letters.

### Chemistry Applied to Agriculture.

By a number of experiments, which have extended over five years, to discover the best means of preventing smut in wheat, by a commission appointed for that purpose, at Rouen, in France, it appears that the best chemical substances tried, were solutions of the sulphate of soda and lime, and the sulphate of copper. Different kinds of wheat, in various states—good, bad and middling, were all fairly tried, and the results carefully noted. The experiments were so precise that there could be no mistake about the matter. Wheat was tried without any preparation, one lot with washing in pure water before sowing; another steeped in a solution of salt; another steeped for one hour in a solution of the sulphate of copper; another in a solution of arsenic; another prepared with slacked lime; another with a solution of the sulphate of soda and lime.

The best results were from the seed wheat prepared with the solution of the sulphate of soda and lime, and this is recommended to the farmers to use. The arsenic is condemned as not being good, and on this point we agree with them. This subject is worthy of the attention of our farmers. We believe that good wheat alone should be used, and that by steeping it in a solution of common salt (muriate of soda) and then preparing it for sowing with slacked lime, the best results will be obtained. It does not appear that the French Commission tried this experiment, although it is well known to some of our farmers.

### The Velocity of Electrical Waves.

Some ingenious experiments have been performed at the Cincinnatti Observatory, in connection with the magnetic telegraph, to ascertain if there be any sensible time occupied in the transmission of the wave or current of electricity between the two points where relative longitudes are required. If there be a sensible velocity, it must involve a correction for the difference of longitude as determined by star signals passed along the waves or through the ground by electrical currents between the two observatories. Thus far, Professor Mitchell says, all results tend to the conclusion that there is no sensible wave time. Other methods may lead to a different conclusion. Experiments performed some months since, by Mr. Walker, lead that gentleman to believe he had detected and measured a wave time. The subject is interesting, and now becomes important as an element in the determination of longitudes by the magnetic telegraph.

### Railroad Racing.

There is at present a new feature in the jockey world, nothing less than locomotives are entered, and the contest is between the Central and the Rutland Railroads, Vermont. The competition extends on the one route down over the Northern, Concord, Nassau, and Lowell roads, to Boston. Over the other, down the Cheshire and Fitchburg, to Boston. The racers carry the mails only no passengers, therefore we say, "*whose's afraid?*" A short time ago John McArdle sold his great trotting horse Mac, for $3000, and it was cheap at that, but we could furnish one made of iron that could beat him four miles to one, and bump him off the course into the bargain.

### Distillation of Peat.

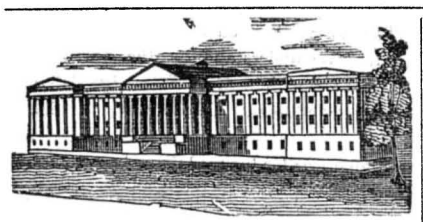
Dr. Anderson, an eminent chemist, publishes a statement which completely contradicts the splendid accounts that have been disseminated about the value of the *Irish Peat Bogs*. He says the whole statement, as it has been made to Parliament, is "altogether very much exaggerated," and there is no hope of peat being used for any other purpose, at present, than for that for which it has heretofore been applied.

### The Astronomical Electrical Clock.

Prof. Mitchell, of Cincinnati, claims to be the original inventor of the Astronomical Electrical Register, and a prior inventor to Dr. Lock. He publishes letters in the Cincinnati papers to prove the priority and usefulness of his invention.

We have exercised the patience of some of our excellent correspondents, but we will soon be able to clear up our regular file.

© 1849 SCIENTIFIC AMERICAN, INC



## LIST OF PATENTS CLAIMS

ISSUED FROM THE UNITED STATES PATENT OFFICE,

*For the week ending October* 30, 1849.

To Charles W. Copeland, of Brooklyn, N. Y., for improved method of flooding and entering powder magazines.

What I claim is attaching to, and combining with the known Magazine (having its ejection, and injection pipes for flooding and continuing a circulation of cold water through it,) and the governing cocks connected together; a connecting piece to be effected by heat without necessarily coming in contact with fire, this connecting piece being governed by a spring when not caused to operate and being capable by the action of heat to flood the magizine, the whole being arranged or constructed substantially as herein more fully described.

I also claim attaching and combining with the Magazine a double tube or equivalent arrangement by which articles may be conveyed into or from the magazine, without in any way exposing the interior of the magazine to fire from without by which several arrangements a perfect security is effected against firing the magazine of vessels of war, all of which is fully described herein.

To Hammond Doane and Allen Goodman, of Dana, Mass., for improvement in lathes for turning.

What we claim as our invention is the combination of the sliding cutter stock, the friction wheel, and two or more patterns, the spindles and the changing lever substantially as herein described, and for the purpose set forth.

To John Ericsson, of New York, for improved arrangement of engines for using steam expansively.

What I claim is placing the axis of the crank shaft or single acting beam engines in which the steam is applied expansively nearer to a line parellel to the axis of the cylinder, and passing through the axis of vibration of the beam on the principle herein specified, and for the purpose of obtaining a more regular mechanical action on the crank by the application of the expansive principle of steam as described.

And I also claim in expansion engines having two cylinders with pistons moving in opposite directions, and connected with cranks on opposite sides of the centre, in one of which the steam acts by expansion alone, having one end of the large or expansive cylinder at all times in connection with the condenser, and the other alternately in connection with the condenser, and with the steam end of the smaller cylinder, that the large piston, during its return stroke, may have a vacuum on each side, as described, when this is combined with the smaller cylinder connected with the boiler, and so arranged as to have both ends in connection with one end of the larger or expansive cylinder, so that when the pistons of the smaller cylinder is acted upon one side by the steam there will be a vacuum on the other side and when the steam is acting by expansion on the larger pistons, it shall be in connection with both ends of the small cylinder as described. I do not wish to be understood as claiming the mode of connecting the small and the large expansion cylinders when so arranged that the two pistons are connected and move together, and in the same direction, for this was known before, in what is known as the Leghwater Engine, but I do claim it, when arranged as and in the combination herein specified.

And thirdly in combination with a two throw crank shaft having the two cranks on opposite sides of the centre, the making of the second of the two engines so connected of greater capacity.

[Will any person explain the difference between the third claim of Mr. Erricsson and McMaught's double cylinder engine.]

To Richard Garsed, of Frankford, Pa., for improvements in looms for weaving figured fabrics.

What I claim as new, and for which I desire to secure letters patent is, first, operating the heddle frames by the direct application of a cylinder to them, substantially in the manner and for the purpose set forth. Second, I claim the mode of changing the patterns on one cylinder, and at each operaiion turning the cylinder so far as to pass over the intermediate patterns and bring the desired one under the heddle frames as above described, and I also claim the apparatus for turning the cylinder substantially as herein specified, whereby the cylinder can be turned through a greater or less arc as may be required, substantially as herein described.

To Daniel K. and John K. Harris, of Allensville, Ind., for improvement in Mowing Machines.

What we claim is the construction and use of the mortise or guide slot in combination with that for the axle of the driving wheel for the purpose of allowing the wheel, or thills, or both, to rise and fall without elevating or depressing the blades.

To Carter, Harris, and Carter, (Assignees of Harris & Carter,) of Yorkshire, N. Y., for improvement in Corn Shellers.

What we claim is constructing one or more of the bars of the concave or hinged sections which turn in an arc whose axis is at right angles to that cylinder whereby the ears are subjected to opposite and oblique rubs facilitate the stripping of the grains from the cobs.

Secondly, Feeding the corn into the throat of the sheller by means of a fluted roll which delivers the ears with their axes parallel to that of the cylinder whereby the breaking of the cobs is prevented and the shelling is expedited.

Thirdly, The employment of the hinged gate to prevent the ears from being fed into the sheller either endwise or too rapidly.

To A. J. Howell, of Spruce Hill, Pa., for improvement in Winnowing machines.

What I claim is the combination and arrangement of the horizontally sliding screen and shaking shoe, operated in the manner and for the purposes set forth.

To J. F. Mascher, of Philadelphia, Pa., for improvement in Regulators.

What I claim is the combination and arrangement of the radial arms, and arms arranged in pairs, and spiral springs surrounding the same, and the fan-wings and segments of a rim of circular curb, for regulating the speed of machinery, substantially in the manner herein set forth.

To Charles Pope, of Syracuse, N. Y., for improvement in Hames Harness.

What I claim is the giving the inner edges of harness Hames a concave form, to enable them to be fitted with greater accuracy to the roll upon the collar, and thereby securing them against displacement substantially as herein set forth.

To D. H. Southworth and James R. Hitchcock, of New York, for improvement in Rice Hullers.

What I claim is, first, The employment of rows of brushes on a rotary stock, in combination with a surrounding wire gauze cylinder, when the said rows of brushes or rubbers, are made with their forward edges beveled, or with the equivalent thereof, substantially as described, whereby the entrance of the rice or other grains, between the brushes and the surrounding cylinder is insured, as described.

Second, The rows of inclined feeders or conductors, in combination with, and interposed between, the rows of brushes, as described, to convey the rice or other grain through the machine, as described, and this is claimed in contradistinction to inclined feeders or conveyors, used at the end of the brushes.

Third, The rubbers made of India rubber at the feeding-in end of the machine, in combination with the brushes, substantially as described, for hulling the grain preparatory to the operation of the brushes.

Fourth, The polishers made of lambs' wool, or other equivalent substance, at the delivery end of the machine, in combination with the brushes, substantially as described, for polishing grain preparatory to its delivery, as described.

Fifth, Connecting the brushes with the stock by adjustable means, substantially as described, for adjusting the periphery of the brushes to the wire gauze cylinder, as described.

And finally, making the inclination of the face of the feeders, adjustable relatively to the axis, substantially as described, for regulating the passage of the grain through the machine, substantially as described.

To Elnathan Sampson, of Claremont, N. H., for improvement in Pendulum balances.

What I claim therein as new, is the combination of a pendulum balance, having a wing or fan attached thereto, to prevent its vibrations, substantially as described, with the adjustable counter-balanced platform for weighing, interposing the chain and cam in the manner set forth.

I claim, in combination with the above apparatus, the scale for small weights, so arranged in connection with the levers of the platform scales as to have the same index indicate the weight of articles placed on either the large or small balance; and, lastly, I claim the arrangement of the platform levers, both working in one direction with the adjustable weight appended thereto.

To John W. Sherman, of Ontario, N. Y., for improvement in Seed Planters.

What I claim is, The combination of the spring catch with the lever, substantially in the manner and for the purpose herein set forth.

The combination of the device, (consisting of the rod connected with the short arm of the lever for opening and closing the register with the devices for gearing and ungearing the seed roller and raising and depressing the drill teeth, as described.

To John M. Smart, of New York, for improvement in grease boxes for axles.

What I claim is the auxiliary oil cup in combination with the cup which holds the cotton waste, or other fibrous substance, under the journal, when said combination is effected by means of the partitions, substantially as herein described.

To Joseph Wentworth, of Palatine, N. Y., for improvement in carpet cleaning machines.

What I claim is the application of the recoil strokes of elastic rods from tension, as described to successive portions of a carpet or other fabric, moved over rollers in sliding frames, made adjustable by means described, by means of which the carpet or other fabric is rapidly and smartly beaten and thereby cleansed from its dust and other impurities.

To James M. Witham, of Washington, Pa., for improvement in Tailors' Measures.

What I claim is the arms in the symmetrical rule, in combination with the dial plates, to which they are attached by pivot joints, as herein described and represented.

To James D. Willoughby, Scotland, Pa., for improvement in apparatus for raising and carrying water.

What I claim is the arrangement and operation of the cord—passing it round a pulley at or near the highest part of the track, substanially as herein set forth, whereby the carriage can surmount any elevation intervening between the well and the point where the water is to be delivered without the use of a return cord.

To Jerome B. Woodruff, of Washington, D. C., and Benjamin M. Townsend, of Quincy, Mass., for improved File supporter.

What we claim is the combination of the yielding guide rolls for supporting a hand file during the operation of sharpening the teeth of saws with the adjustable clamp stock on which they are mounted, substantially as set forth.

To John B. Tarr, of Albany, N. Y., for improvement in Fire Engines.

What I claim is the combination of the horizontal vibrating brakes, with the engine—said brakes being so constructed and arranged that any desired number of hands may conveniently apply their united power to the alternate action of the pistons whilst standing upon the ground in parallel rows, at right angles to the sides of the engine. The handles or propelling rods being so connected with the brakes that they can be brought parallel with and connected to them so as not to extend beyond the sides of the engine, when the latter is not in use, by which the advantages set forth in the specification are obtained.

DESIGNS.

To Morrison & Tibbits, (Assignee of Abram Harvey,) of Troy, N. Y. Design for Stoves.

ADDITIONAL IEPROVEMENTS.

B. G. H. Hathaway, of Rock Stream, N. Y., for improvement in machines for threshing and cleaning grain. Patented July 5, 1848. Additional Improvement annexed.

What I claim is, first, the modification of the shoe by the employment of the cover, as herein specified, to the upper spout, and forming an offset and opening, together with the spout, as described.

I also claim the concave, made adjustable and reversable in the manner and for the purposes set forth.

### Planing Machine Patent Cases.

The following charge of Judge Grier, reported for the Ledger, contains some of the most important information, relative to patents, their nature, the nature of an infringement, &c., that we have ever read. We consider it of great value to all our readers, for if there are thousands of them who care nothing about patents now, the time may come when, for some cause or other, it may be of great use for reference. Let it be carefully preserved. We will publish one column of it every week until it is finished.

Jacob P. Wilson *vs.* Danial Barnum.—In Circuit Court U.S., Eastern District of Pennsylvania. Issue directed from Chancery.

The Plaintiff, as the owner of the Woodworth patent, in this county, filed a bill in equity, complaining that the defendant was infringing, by running two machines, one for planing, and the other for tongueing and grooving boards. Mr. Barnum admitted that he was running, and contended that he was lawfully entitled to run, both the machines; because, 1. The planing machine is his own invention, that he applied to the Government as the inventor of it, and received letters patent in 1849. 2. The tongueing and grooving machine is a combination of circular saws, known to the art since (at least) 1793. Issues were ordered to try the question of infringement.

The Jury were discharged by Judge Grier, after being confined for 26 hours, and stating that they could not agree. They stood—For Wilson, 2; Barnum 10.

Notes of charge by Grier, Justice, filed of record in the case.

This case was commenced on the chancery side of this Court by a bill in equity, filed by Jacob P. Wilson, who is assignee of what is commonly known as the Woodworth patent for planing and grooving board, complaining of an infringement by the defendant, Daniel Barnum, and praying an injunction to restrain him using certain machines in his possession, and from making or vending the same to others to be used.

In the defendant's answer to this bill, he denied, 1st. The originality of the plaintiff's invention: and, 2d. That the machine or machines used by him infringe upon the plaintiff's invention, and claims that his machine is a new combination of mechanism, invented by himself, and for which he has received a patent from the United States.

If the Woodworth patent were a new one, the Court would have ordered an issue to try the question of originality, but as that question has been so frequently investigated and decided in almost every circuit in the United States, and passed upon and confirmed by the judgement of the Supreme Court, we think it is time it should be put to rest. The monopoly granted by law to the inventors of new and useful machines, is but a just reward for the ingenuity, labor and money which have been expended in perfecting them. But although such persons are often great public benefactors the privileges granted to them as a remuneration have too often been found valueless, and the profits of their discoveries or inventions are appropriated by others, while the inventors are ruined by endless litigation. The evils of this course fall not alone upon the inventor, but on the public, who are deprived of a free use of the invention, in consequence of the monopoly, which becomes necessary to remunerate the inventor by his losses by litigation.

(To be Continued.)

A cocoa nut tree has been lately drifted ashore on the island of Valentia, near Kerry, Ireland, another proof that the Gulf stream, after running along the American coast, sets across the Atlantic.

© 1849 SCIENTIFIC AMERICAN, INC

## TO CORRESPONDENTS.

"C. W., of N. Y."—The typographical appearance of your publication is not favorable to its success here, and we have been unable to find any house who would undertake the sale of them.

"S. S. R. of Tenn."—We wrote you too weeks since, giving such advice in regard to your invention, as we believed would be best. We ask for it a candid consideration. We advise you not to spend time or money upon steam carriages, but to direct your best energies, in introducing the first invention.

"G. S., of Ohio."—The substitution of gutta percha for leather or any other substance, for the manufacture of saddles, cannot be considered a patentable subject; and we are unable to discover any new feature in your method of manufacturing. Mr. Dietz, of this city, manufactures them in the same way out of raw hide. $2 received.

"M. J., of Ill."—You had better address Messrs. Baron & Bro., they will promptly answer your enquiries in regard to price, &c.

"C. B. H., of N. Y."—In case specifications and drawings are found defective, they are returned from the Patent Office for amendment. When returned to the Patent Office again, the examination in such cases takes precedence of all new cases on hand at the time of their reception. Your papers will no doubt be examined in a few days, and the result communicated. Accept our thanks for your continued interest in extending the circulation of this journal. We shall be glad to reciprocate.

"N. B., of N. Y."—Your ideas in regard to plows are not clearly understood by us. It is better that you should build a small neat model, and send it to us for examination. $2 received and credited for one year's subscription.

"A. H. P., of Ohio."—We do not discover sufficient novelty in your method of fastening bedsteads to warrant the expense of an application for letters patent. Very many simple contrivances for this purpose are now in use—but we cannot say whether they have been valuable to the originators or not. Your plan will, no doubt, serve the intended purpose well.

"J. McC., of Pa."—Take 1 lb. of pure copper, melt it, then add 2½ lbs. of tin. This makes a good compound for steam or water cocks. $4 received. Each subscriber's name has been entered for six months.

"A. F. W., of Cincinnati."—The first 40 numbers of Vol. 4 could not be furnished complete. Therefore we credited you with the $1. You can purchase the lard lamp of Endicott & Sumner, of this city.

"S. W. O., of S. C."—We have a very high opinion of Messrs. Jackson & Moirs's improved carding machine, illustrated in No. 44 Vol. 4, Sci. Am., a copy of which we have sent you. It has been well tried and gives satisfaction. We know nothing of the expense, and would advise you to communicate with them by letter. We shall write you in a few days concerning the spinning frame—in the mean time, we may learn from J. & M. the price of their machines.

"G. A., of S. C."—The numbers of Ranlet's which you ordered were sent last Saturday. For particulars concerning back Nos. of Ranlett's and Arnott's Architects, see advertisement in another column.

"J. W. C., of Ind."—The drawing of your steam governor are now in the hands of a model maker for attention. We hope to be able to get your business done before long. We are busily engaged all the while.

"G. B., Jr. of Texas."—We are now awaiting advices from you before the papers can be made out. The box of samples were received per ship Austin.

"C. & R., of Ind."—It will cost you $2,00 to have the business attended to. We have sent you 6 copies of the patent laws, as per request. $4 received.

"O. A. J., of Vt."—No. 3, Arnott's Architecture will be sent when issued. You can take more subscribers at the clubbing rates, as you propose. The copy books will be sent before long; you must have patience, as we have but little time to spend in collecting such orders—hope to soon.

"C. P., of Ind."—The drawing of your plow has been examined—we do not discover any patentable feature in the combination.—The X form is a well known device, and could not be claimed as new. The advantages, if any, are not referred to in the communication. If you will be more particular in stating the advantages of your plow over the ordinary kind, we will give it another examination.

"H. C. F., of R. I."—The mass do not believe as we do, but as you do. We go by facts, not fiction. Mrs. Phelps is correct, and that is in accordance with our article, and does not stultify our conclusions at all. Are you sure about the wheel in the cotton factory? We are doubtful, and we know something about it. See that the cause is not owing to the throwing off of some machinery. Do you wish to contradict the correct experiment of Sir James Ross?

"B. F., Va."—Yours has been received; we are much obliged to you, and will give it due attention.

"E. A. D., of N. Y."—We do review some reports, but you know that this is the work of a monthly, not a weekly paper. We present facts for Reviewers to review. We always review scientific pamphlets. Your improvement of the elastic band to the paper stick is good.

"E. W. D., of Mass."—The Sci. American should reach you on Saturday morning: the fault is in the P. O. The resistance on the square foot, at 2000 velocity per second, would be about 48 lbs.

"N. A., of N. Y."—We believe that your lathe is good, but could not be patented.

"A Subscriber, Boston."—We would be happy to inform you of a substitute for the common lobby hat frame, but we do not know of any.

"L. A. F., of Ind."—Eight numbers of Ranlett's Architect were sent to you by mail on the 12th inst. You will get them cheaper by mail than Express.

"J. B. F., of N. Y."—Your model has been received, and the business will be taken up as soon as we can possibly attend to it. We shall not be able to make the necessary drawings and specification for less than $50. The whole apparatus is very complex.

"M. L. D., of N. Y."—Your favor of the 8th has been attended to, the Camera was shipped by the Genesee Valley line, on the 13th, care of Wm. Foote & Co.

"E. Q. S. Jr., of Mass."—We shall write you are opinion concerning the engine in a few days. We had not time to attend to it before going to press with the number.

O. W., of N. Y.; L. M. H., of Pa.; J. Du B., of Ala.; Mrs. M. W. O'M., of N. Y., and C. T.F., of Me.—Your specifications and drawings have been filed at the Patent Office since our last issue, and the models forwarded.

---

Money received on account of Patent Office business, since Nov. 7th, 1849:—

Mrs. M. W. O'M., of N. Y., $50; C. D., & T. L. V., of Pa., $50; A. & W. B., of Ill., $30; O. W., of N. Y., $28; J. H. L., of N. J., $30; R. C., of O., $50; and R. S. N., of N.H., $20.

**Notice.**

We refer our subscribers to No. 5 of this Vol. for particulars in relation to back numbers. We would also say, that whenever our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

# ADVERTISEMENTS.

## Patent Office.

128 FULTON ST.

**NOTICE TO INVENTORS.**—Inventors and others requiring protection by United States Letters Patent, are informed that all business relating to the procuration of letters patent, or filing caveats, is transacted at the Scientific American Office, with the utmost economy and despatch. Drawings of all kinds executed on the most reasonable terms Messrs. Munn & Co. can be consulted at all times in regard to Patent business, at their office, and such advice rendered as will enable inventors to adopt the safest means for securing their rights.

MUNN & CO.,
128 Fulton street, New York.

**TO PRACTICAL MACHINISTS.**—The advertiser having perfected an original invention—a new hydraulic motive power, (which has occupied his attention for four years) and finding his means exhausted, is desirous of obtaining the assistance of an influential machinist to bring the invention into notice and use. References of the highest respectability can be given. Communications (post paid) addressed C, box 421 St. Louis, Mo., will receive prompt attention. 9 2*

**THE SUBSCRIBER,** late of the firm of Haldeman & Seitz, of Marrietta, Pa., formerly engaged in the manufacture and sale of Bridle Bits, has bought out Mr. Seitz in the whole Patent Right and stock on hand. Therefore he now offers to machinists, and dealers generally, the opportunity of buying low, the patent right for States, Counties or Districts in any part of the United States, for the remaining term of the patent right, the date of which is September 26, 1848. Persons buying rights can also be supplied with a small stock to commence the business upon at once, as he is still finishing up the stock on hand in the different styles of japaning, tining and plating. He will still supply the old customers in what stock they may want at reduced prices, until their neighborhood is supplied by new manufacturers.

Any orders either for rights, samples or information will be promptly attended to by

CYRUS S. HALDEMAN,
Bainbridge, Lancaster Co., Pa.

[See Engraving of the above Bit in No. 26, Vol. 4, "Sci. Am."] 9

**THE YANKEE BLADE.**—A large and handsomely printed Weekly Journal, devoted to Literature, Art, Education, Morals, Criticism, Fun, News and Story Telling—and especially desirable to the Family Circle. Published every Saturday, at $2 per annum, in advance.

All letters, (post-paid,) should be addressed to MATHEWS, STEVENS & CO., Publishers "Yankee Blade," No. 12 School street, Boston, Mass.

N. B.—Any person desirous of receiving a copy of the Yankee Blade," as a sample, can be accommodated by notifying the publishers by letter, post-paid.

OPINIONS OF THE PRESS.

THE YANKEE BLADE.—Our readers need not be told that the Yankee blade is an excellent paper. The fact is known and undisputed among all communities into which the paper has been introduced and wherever the name of Mathews, its worthy and accomplished editor, has been made familiar. It gives us pleasure to notice that the labors bestowed on the Blade are justly appreciated by the reading public, and that the editor finds consolation and reward, as well in its popularity, as in the more substantial evidences of friendship and patronage. Very recently, the Blade came to us as bright and shining, and as clear of the least particle of rust, as though it had never before been in use, and when we took it up and turned it over and over, examining its smoothness and keen glittering edge, we could not feel less than gratified at the success of our Yankee friend, and could not do less, the first opportunity, than express all that we felt.—[Godey's Philadelphia Dollar Newspaper.

**NOTICE.**—We have constantly on hand and for sale:

| | |
|---|---|
| Minifie's Mechanical Drawing Book, bound in calf, | $3,00 |
| Cook's Condensing Engine, Plate and Book, | 3,00 |
| Leonard's Mechanical Principia, | 1,50 |
| "Scientific American," bound, 3d and 4th vols. | 2,75 |
| Scribner's Mechanics, | 1,50 |
| Ewbank's Hydraulics and Mechanics, | 2,50 |
| Morfitt's Chemical Manipulations, | 2,50 |
| Ranlett's Architecture in numbers, each | 50 |
| Ranlett's Architecture, 2 vols., bound, | 12,00 |
| Arnott's Gothic Architecture " " | 25 |
| Camera Lucidas, | $6,00 |

MUNN & CO.

**PREMIUM STOVE POLISH, &c.**—Quarterman's Chemical Oil Stove Polish, American Atomic Drier, Electro Chemical graining colors, and gold size. The stove polish is put up in tin boxes of 12 1-2 to 31 1-4 cts. Sold wholesale and retail at 114 John st., New York, by

QUARTERMAN & SON,
8 3m* Painters and Chemists.

**TELESCOPE FOR SALE.**—A fine five and a half feet reflector, with five inch aperture, Herschelian and Newtonian construction combined, with equatorial movement, for sale by

2*7 G. D. HISCOX, 31 Jay st., N. Y.

**STEAM ENGINE FOR SALE.**—A Steam Engine of 80 horse power, with two return flue boilers, all complete. The Engine was made by Hogg & Delamater, of this city, and has been run less than one year—cost $6000 and will be sold for $3000—the manufacturing company that used it having failed.

Application must be post paid, to

SAMUEL C. HILLS,
Machinery Agent, 43 Fulton street,

Who has constantly for sale, Engines, Lathes, Planers, etc. etc. 6 4

**PARKER'S WATER WHEEL.**—The Subscriber offers rights for Sale, by Counties or States, of the Best Water Wheel for Grist Mills, in the United States, which will grind a bushel of corn from three to eight minutes, under a head of water from five to ten feet. It being at the same time simple and durable; any person purchasing a State right will be furnished with a model, and by addressing the Subscriber at Camden, S. C., will have all satisfactory information given.

4 3m* EMANUEL PARKER.

**ENGINE LATHES.**—The Subscribers are now manufacturing, and have constantly on hand, an extensive assortment of the best patterns of Engine Lathes, which they offer at the following prices:—A Lathe 8 feet long, swing 19 inches, with back and screw gearing, drill chuck, centre and follow rest, $200; ditto, without screw gearing, $150; ditto, without fixtures, $125. For particulars of other sizes, address, (post-paid) SCRANTON & PARSHLEY, New Haven, Ct.

Munn & Co., Scientific American Office, are Agents for the above Lathes. Universal Chucks for sale at $15. 4. 3m.*

**DAGUERRIAN MATERIALS.**—JOHN ROACH, Optician, 79 Nassau st., N.Y., is manufacturing American Cameras of imported Flint Glass, which are warranted equal to any. Also, on hand, Voightlander Cameras. Plates, Cases, Chemicals, &c. Galvanic Batteries for gilding and silvering. Electro Magnetic Machines for medical purposes. Thermometers wholesale and retail. Object Glasses of various sizes, ground to order and warranted achromatic. 2 10*

**EMPLOYMENT.**—Pleasant and profitable employment may be obtained by a number of intelligent and active young men, in every County, by addressing postpaid, FOWLERS & WELLS,
Publishers.
129 and 131 Nassau-st, New-York.

P. S.—A small capital, with which to commence, will be necessary. Agents who engage in this enterprise will be secured from the possibility of loss.

5 3m*

**THOMAS E. DANIELS' PLANING MACHINES**—Manufactured by HOWE, CHENEY & CO., Worcester, Mass. All orders for the above machines executed at short notice and satisfactory prices. 2 4m*

**Z. C. ROBBINS,**
CONSULTING ENGINEER AND COUNSELLOR FOR PATENTEES.
Office on F street, opposite Patent Office, Washington, D. C. j20 tf

**NOTICE TO CAPITALISTS.**—We are authorized, by a company in the State of Ohio, to call the attention of those interested in the manufacture of flour and woollen goods, to the sale of a large and well established concern in one of the best regions of the great State. The ill health of the partners compels them to retire from business. The full particulars in relation to the above property, may be had by personal application to the subscribers, or by letter, post-paid. MUNN & CO.,

3 6* 128 Fulton st., N. Y.

**LAW'S NEW PLANING MACHINE**—For boards and plank, is now in operation in this city—planing, tonguing and grooving at the same time, with rapidity and beauty. It is believed to be superior to any other machine, as it will do the work of two or three rotary machines, and for all Southern, and the majority of Northern lumber, the execution is much better.

Machines, with rights for States, or Counties, can be had by applying to the subscriber, at 216 Pearl street, or at Collyer & Dugand's mill, foot of West Fourteenth street, where the machine is at work.

2 tf H. LAW.

**SUPERIOR TURNING LATHES.**—James Stewart, 15 Canal st., and 106 Elm st. is constantly manufacturing and has now on hand between 50 and 60 superior Lathes of the following descriptions and at reasonable prices, namely:

Dentist's Lathes, very highly finished.
" " common,
Brass and Wood Turner's Lathes.
Jeweller's and pencil-case maker's, very superior.

J. STEWART is also authorized to act as agent for the sale of the celebrated Lathes manufactured by James T. Perkins of Hudson, of large size and at prices from $250 to $800. A specimen of this description may be seen at his factory as above. j27 tf

**FAIRMAN'S PATENT UNIVERSAL** CHUCK, FOR LATHES.—Oliver Snow & Co.'s Hand Planing Machines, also Lathes for dentists, Jeweller's, Wood Turners, &c. Lathe Wheels, Bands, Hooks and Eyes, Circular Saws, Saw Mandrill's and every other description of Tools for Machinists, Carpenter's, Coachmakers, &c., constantly on hand at WOOD'S old established Tool store, corner of Chatham and Duane streets, New York.

Planes made to order and warranted.

Carpenters' and amateurs' Tool Chests, &c. 49 3m*

**BRITISH PATENTS.**—Messrs. Robertson & Co., Patent Solicitors, (of which firm Mr. J. C. Robertson, the Editor of the Mechanics Magazine from its commencement in 1833, is principal partner,) undertake THE PROCUREATION OF PATENTS, for England, Scotland, Ireland, and all other European Countries, and the transaction, generally, of all business relating to patents.

Instructions to Inventors can be had gratis, on application to Mr. THOMAS PROSSER, 28 Platt street, New York; as also the necessary forms of Petition and Declaration for British Patents.

PATENT OFFICE,
m1 tf 166 Fleet street, London.

**LAP WELDED WROUGHT IRON** Tubes, for Tubular Boilers, from 1 1-2 to 8 inches in diameter.—These are the only Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France, and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER, Patentee,
m1 28 Platt street, New York.

**TO INVENTORS.**—The subscriber begs leave to inform inventors and others that he manufactures working models of machinery &c. in a neat workmanlike manner. Patterns of every description made for Castings. Scroll sawing neatly executed.—Mathematical and Nautical Instrument Cases of every description. JOSEPH PECKOVER, 240 Water street N.York, (between Beekman st. and Peck Slip.) j30 5m*

**TO IRON FOUNDERS.**—Fine Ground Sea Coal, an approved article to make the sand come off the Castings easily; fine bolted Charcoal Blacking; Lehigh fine Dust, and Soapstone Dust for facing stove Plates, &c. &c.; also, Black Lead Dust and Fire Clay, for sale in Barrels, by GEORGE O. ROBERTS SON, 303 West 17th street, or 5 Liberty Place, between Liberty st. and Maiden Lane, N.Y. 9 14*

**ADEE'S AMERICAN CAST STEEL** Works, (at the foot of 24th st., E. River, N. Y.) The above works are now in successful operation, and the proprietor would respectfully call the attention of machinists and all consumers of the article to an examination of his Steel, which he is warranted by the testimony of the principal machinists and edge tool makers of this city, in recommending as fully equal in every respect to any ever used in this country.

A full assortment of the different sizes constantly on hand, which the public are respectfully invited to call and examine at the office of DANIEL ADEE,

51 6ms 107 Fulton street, New York.

**BLAKE'S PATENT FIRE PROOF** PAINT, from Ohio, which in a few moments turns to slate or stone, protecting whatever covered from the action of the weather and from fire. Purchasers should be particular and see that every barrel is marked "Blake's Patent Fire Proof Paint," as there is any amount of worthless counterfeit stuff in the market, called fire proof paint. The genuine article for sale by the patentee, at No. 3 Broad st, N.York.

51 12* WILLIAM BLAKE.

**FOREIGN PATENTS.**—PATENTS procured in GREAT BRITAIN and her colonies, also France, Belgium, Holland, &c., &c., with certainty and dispatch through special and responsible agents appointed, by, and connected only with this establishment.—Pamphlets containing a synopsis of Foreign Patent laws, and information can be had gratis on application

JOSEPH P. PIRSSON, Civil Engineer,
3 tf Office 5 Wall street, New York.

**CAMERA LUCIDA.**—Notwithstanding the demand for these useful instruments has been so great, we are yet able to supply orders for them.

Every draughtsman and every person that desires to foster a taste for the beautiful art of sketching should surely have one.

Just received, a new and more beautiful article than has before been offered for sale in this country.

Address MUNN & CO., at this office. Price $6, boxed and shipped where directed. 3tf

**PHILOSOPHICAL AND CHEMICAL** APparatus for Colleges and Schools, and Engineering Instruments.—JAMES GREEN, 175 Broadway, New York, and 43 South street, Baltimore, Manufacturer and Importer of every kind of Philosophical and Chemical Apparatus, and Optical and Mathematical Instruments, Barometers, thermometers, telescopes, Drawing Instruments, pocket Compasses, &c. wholesale and retail. Experimental Apparatus and Models made to order. 1 3m*

**BARLOW & PAYNE,** Patent Agents and Consulting Engineers, 89 Chancery Lane London
m12 tf Patent Journal Office.

© 1849 SCIENTIFIC AMERICAN, INC

# Scientific Museum.

### Ventilation.

The experiments of Leblanc upon vitiated atmosphere are of high interest. The quantity of carbonic acid in the atmosphere in the normal state, has been shown by the Saussures to vary from 3 to 6 parts in 10,000. Leblanc (Ann. de Chim. v. 223), has examined the quantity in crowded rooms, theatres, cities, &c. In the hospital La Pitie, the air of one of the wards containing 54 patients, afforded 3-1000 of carbonic acid, that is, 5 times more than that of normal air. Under similiar circumstances, at the Salpetriere, the quantisy was 8-1000. In Dumas' class room, after a lecture of an hour and a half, where 900 persons were present, the carbonic acid amounted to 1 per cent., and the same quantity of oxygen had disappeared. From other experimeuts, he considers this a maxium quantity for safety, and strongly recommends a better ventilation when so much carbonic acid is present. The result agrees with experiments made in this country. When the atmosphere is deteriorated by burning charcoal, he has seen death produced when 3 per cent. of carbonic acid was present in the atmosphere. In all such cases of death from stoves, he has found carbonic oxide in the air, and he attributes a deleterious effect to the agency of this gas. He has observed 1 per cent of this gas to destroy an animal in two minutes, which is at variance with the statement of Nysten. This observation explains many of the inconsistencies which appeared some years ago in the evidence of some London chemists respecting the influence of Joyce's stoves. It is quite obvious that their structure was dangerous. Leblanc found that a candle was extinguished in air containing 4½ or 6 per cent. of carbonic acid. In such an atmosphere, life may be kept up for some time but respiration is oppressive, and the animal is effected with very great uneasiness. Air expired from the lungs contains about 4 per cent. of carbonic acid, and hence this atmosphere is noxious. Even 3 per cent. in the atmosphere killed birds.

### Spiders.

This insect casts its skin once a year; to do this it forms a kind of thick purse in one corner of the web, like that which is used to enclose the eggs. It then goes to the centre of the web and begins to distend its body with violence, for some minutes, until it splits the skin the whole length of the back. When this is effected it begins slowly to force its body through the aperture, and then gradually draws out its legs, one by one, till they are all extracted. The exuviæ retains the entire form of the spider, but is perfectly transparent. The insect itself, after this great change, remains quite gelatinous, and of a pale green color, and it retreats to the afore-mentioned purse or bag, leaving the skin suspended in the web. It quits its shelter in about three days.

### The Equator.

About the year 1810, Dr. Mitchell advanced an hypothesis to account for the existence of animal remains, belonging to warm and low latitudes, being found in the cold and frozen climates of the north. He supposed the axis of the globe to have changed 90 degrees, at some remote period. That the old equatorial line extended in the northern hemisphere, from the Bay of Bengal, near where the mouth of the Ganges is, through Thibet, Tartary, and Siberia, to the present North Pole, and thence along in North America through the tracts west of Hudson's Bay and Lake Superior, to the sources of the Mississippi, and thence down to the Gulf of Mexico, near its places of disemboguement, and so onward across New Spain to the South Sea.

### Guns.

Small guns were invented by Swartz, a German, about 1378; brought into use by the Venetians, 1382. Cannon were first used at the battle of Cressy, 1346; first used in England at the siege of Berwick, 1405; first cast in England, 1544; used in shipping by the Venetians, 1539; before they were only used to batter walls. Mohammed, at the siege of Constantinople, employed some of the largest guns ever made use of before or since. One of his cannon was of such enormous size as to require 70 yoke of oxen to draw it, and 2000 men to man it. It discharged a ball of the weight of 300 lbs. The report was heard to a great distance, and the country shaken to the distance of 40 furlongs.

### History of Propellers and Steam Navigation.

The term Propeller, as it is now applied to vessels propelled by submerged machinery, is very incorrect. A locomotive may as justly be termed a *propeller* as a ship which is driven by a screw. Nevertheless it is only a foolish waste of words to cavil upon such things as these, therefore we use the term as referring only to nautical vessels, as it is now generally understood, and which will be more fully explained hereafter.

The most ancient vessel on record was one that was propelled without oars, paddles, wheel or screw, and we must give it the preference in point of primogeniture to the very ancient canoe of the Indian, who is here represented with his paddle in his hand,

"Skimming Ontario's waters blue,
Like the swallow's wing, in his bark cannoe."

The original vessel to which we refer was the Ark of our father Noah, beside which the modern Great Britain would be like a herring beside a whale.

The most ancient navigators that we have any account of, were the Phœnicians. The cities of Tyre and Carthage were famous for their fleets, and their citizens for maritime skill, such as was known in those days. To them the then distant Island of Albion was not unknown, for thither they came with their oared galleys to dig tin from ancient Cambria's bosom. From all that we can correctly gather on the subject of ship propulsion, the oar was the only universal instrument used for that purpose in the days of old, and a good instrument it is for that purpose, far superior, when the power applied is manual, to that of the paddle wheel, owing to the oarsman being able to apply his power more economically to the oar than the wheel. The application of wheels to propel boats dates as far back as the time of the Romans, or as some say, the Egyptians, but upon this point we are not positive, therefore we have arrayed an "ancient mariner," at the wheel, as a cosmopolite, belonging to any part of the world our readers may assign

him. In 1682 Prince Rupert propelled his barge in this manner, and there are two or three other instances on record nearly as old. Of one thing we are certain, that before the introduction of steam propulsion, navigation was a slow process, and that is not long ago. If Solomon had been acquainted with such a power of propelling the ships of his fleet, they would not have taken three years to make their voyages for peacocks and *California* gold.

In commencing this history we can do but little more than introduce the subject in this article, previous to entering upon a connected, clear, and the most complete history of steam navigation that has yet been published, and which is the first attempt of the kind by any periodical whatever. Along with other great improvements of the age, the newspaper press in this instance, assumes the office—the dignified office, of historian, as well as chronicler.

The great improvement which has been effected by steam power, as applied to navigation, by increasing the intercourse between people of different and distant nations, has resulted more than any other invention on record, (and is still augmenting) to unite mankind, we hope, in one great family, working in concord for their common good. The steam engine may be called the grand improver of the age. Its power can be increased to almost any extent, and can be made to execute the most difficult and delicate operations. For business or pleasure it conveys the traveller from place to place, with celerity, convenience, and economy.

The origin of the application of steam to propelling vessels is claimed by several persons of different nations. Tug vessels propelled by wheels driven by horses, were proposed and employed long before steam was thought of for that purpose. The most early account in our possession respecting the employment of steam to propel vessels, is that of a Spanish Captain, named Blasco De Garey, who, it is said, in 1543, in the presence of Charles V., in the harbor of Barcelona, propelled a vessel of 200 tons burden, against wind and tide, at a considerable speed. The account of this vessel is taken from the Royal Archives of Simuncas, and was first given to the world in 1825. The vessel is described to have had paddle wheels suspended on its sides, but after the experiment was made, although the emperor paid all the expenses, the inventor took out his machinery, and with the *wisdom* of all ancient inventors, left it to rot in darkness. Quite a controversy has existed among paper wasting historians, respecting the nature and construction of De Garay's steamboat, but all that we have been able to learn from an examination of opposite opinions about it, is nothing at all, and since De Garay has not enlightened us himself, we may justly dsmiss the claims of Spain, for nothing was heard about it by the world until steam navigation had been successfully established both in America and Great Britain. In this introduction we speak no more than our honest convictions, when we assert that the steamboat is not such a wonderful *invention* in *itself*; and that to none of its successful inventors—Miller, Fulton and Bell—can we award such high laudations as are generally conferred upon them by common historians, lecturers and florid essayists. The steam engine, is the parent of the successful steamboat, and this will be fully established as we proceed in this history, for long before Miller, Fulton and Bell, steamboats had been built and tried, but all were dead failures, until the improved steam engine of Watt, was applied to them, with it they at once, on the Hudson, in the New Word, and on the Clyde, in the Old,

"Walked the waters like things of life."

In our next we will publish an engraving of Jonathan Hull's Steamboat for which a patent was granted, the first of its class on record.

### Caoutchoucine.

This is a highly inflammable liquid obtained from caoutchouc by destructive distillation. It has excited considerable interest among chemists from two very extraordinary characteristics which it is found to possess, viz., that in a liquid state, it has less specific gravity than any other liquid known, being considerably lighter than sulphuric ether, and in a state of vapour it is heavier than the most ponderous of the gases. When mixed with alcohol, it is a solvent of all the resins and particularly copal, which it dissolves at the ordinary temperature of the atmosphere a property possessed by no other solvent known. It is thus particularly useful for making varnishes in general. It also mixes readily with oil, and has been found particularly valuable for liquefying oil paints, which it does without in the slightest degree affecting the most delicate colours; for it speedily evaporates, and the paint is then dry and firm as before solution.

### Oriental Cooking.

The following from Lynch's Narative, will give us an idea of something to be greatful for, viz., the blessings of civilization :—"We were amused recently at witnessing an Arab kitchen in full operation. The burning embers of a watchfire were scraped aside, and the heated ground scooped in a hollow to the depth of six or eight inches, and about two feet in diameter. Within this hole was laid, with scrupulous exactness of fit and accomodation to its concave surface, a mass of half-kneaded dough made of flour and water. The coals were again raked over it, and the fire replenished. A huge pot of rice was then placed upon the fire, into which, from time to time, a quantity of liquid butter was poured and the compound stirred with a stout branch of a tree, not entirely denuded of its leaves. When the mass was sufficiently cooked, the pot was removed from the fire and the coals again withdrawn, and the bread taken from its primitive oven.—Besmeared with dirt and ashes, and dotted with cinders, it bore few evidences of being an article of food. In consistency, as well as in outward appearance, it resembled a long-used blacksmith's apron rounded off at the corners. The dirtiest ash pan of the southern negro would have been a delicacy compared to it. The whole party gathered round the pot in the open air, and each one tearing off a portion of the leather bread, worked it in a scoop or spoon, and dipping pell-mell into the pilau, made a voracious meal, treating their spoons as the Argonauts served their tables, eating them for dessert. With a wash in the Jordan they were immediately after ready for sleep, and in half an hour were as motionless as the heaps of baggage around them.

### Missouri Rice.

A farmer, near St. Louis, has raised some excellent rice without irrigation (submerging the plant for some time) and it is said to be full and sweet in the berry, although not so white as that grown farther South.

### LITERARY NOTICES.

CHAPMAN'S AMERICAN DRAWING BOOK.—No. 3 of this splendid work has just been issued by Redfield, at Clinton Hall, Nassau street, N. Y. It treats of Perspective, and with a masterly hand. The engravings are superb and the typography unsurpassed by any book with which we are acquainted. It is an honor to the author and publisher, and a credit to our common country. The art of drawing is a useful and elegant accomplishment, and no person can avoid this conclusion after looking over the pages of this work.

THE BANKER'S MAGAZINE AND STATISTICAL REGISTER, for November, contains a most able article on Repudiation, and an admirable essay on Life Insurance; these, together with Bank Statistics, and many other miscellaneous articles, make up a capital number. This work is edited and published by J. S. Homans, Baltimore, and is essentially a standard work of great usefulness.

TO INVENTORS AND MECHANICS.

FIFTH YEAR OF

**The Best Mechanical Paper**

IN THE WORLD!

A New Volume of the

**SCIENTIFIC AMERICAN**

is commenced about the 20th of Sept. each year, and is the best paper for Mechanics and inventors published in the world.

Each volume contains 416 pages of most valuable reading matter, and is illustrated with over

**500 MECHANICAL ENGRAVINGS**

of NEW INVENTIONS.

☞The Scientific American is a Weekly Journal of Art, Science and Mechanics, having for its object the advancement of the INTERESTS OF MECHANICS, MANUFACTURERS and INVENTORS. Each number is illustrated with from five to TEN original ENGRAVINGS OF NEW MECHANICAL INVENTIONS, nearly all of the best inventions which are patented at Washington being illustrated in the Scientific American. It also contains a Weekly List of American Patents; notices of the progress of all Mechanical and Scientific Improvements; practical directions on the construction, management and use of all kinds of MACHINERY, TOOLS, &c. &c.

It is printed with new type on beautiful paper, and being adapted to binding, the subscriber is possessed, at the end of the year, of a large volume of 416 pages, illustrated with upwards of 500 mechanical engravings.

TERMS: Single subscription, $2 a year in advance; $1 for six months. Those who wish to subscribe have only to enclose the amount in a letter, directed to

MUNN & CO.,
Publishers of the Scientific American,
128 Fulton street, New York.

All Letters must be Post Paid.

**Inducements for Clubbing.**

| | | | | |
|---|---|---|---|---|
| 5 | copies for | 6 | months, | $4 00 |
| 5 | " | 12 | " | 8 00 |
| 10 | " | 12 | " | 15 00 |
| 20 | " | 12 | " | 28 00 |

Southern and Western money taken at par for subscriptions. Post Office Stamps taken at their full value.

A PRESENT!

To any person who will send us Three Subscribers, we will present a copy of the PATENT LAWS OF THE UNITED STATES, together with all the information relative to PATENT OFFICE BUSINESS, including full directions for taking out Patents, method of making the Specifications, Claims, Drawings, Models, buying, selling, and transferring Patent Rights, &c.

N. B.—Subscribers will bear in mind that we employ no Agents to travel on our account; a list of our local agents will be found in another column—all of whom are duly authorized to act as such, and none other.


© 1849 SCIENTIFIC AMERICAN, INC